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ABSTRACT

Five newsletters examine a variety of topics dealing with learning disabilities. Topics include the following: ways to help learning disabled (LD) seniors plan for higher education, transitional college programs, the changing role of neurologists in the field of LD, the place of math in the education of LD students, instructional reasons for LD students' lack of success in math, a transactional analysis model to improve classroom communication, strategies training for language learning disabled students, a tri-dimensional model of communication effectiveness, techniques to increase comprehension of figurative language, central auditory processing deficits of LD adolescents, a neurologist's view of language development as a bilateral hemisphere task, indicators for full time placement in remedial settings, and equestrian activities for language learning disabled students. (CL)

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HILL TOP Spectrum

Hill Top Preparatory School
Rosemont, Pennsylvania 19010
Vol. 2, No. 1 September, 1984

Helping Learning Disabled Seniors Plan for Higher Education

by James H. Fisher, M.Div., and Deborah Sahijwani, M.Ed.

Introduction

Not long ago, it was thought that a student with a history of underachievement or learning disability might not get through high school, and if he/she did graduate, future career prospects would be limited. Fortunately, the outlook has changed. New opportunities open as the public becomes more aware of the problems of learning disabled or underachieving students and as educators plan more realistically for them.

A choice of options is now possible depending on the student's functioning intelligence, the desire to succeed, the skills acquired, and the counseling he/she has received. These include trade or technical school; apprenticeship in certain specific trades; regular employment within the community; armed services; two or four year college.

This article addresses an approach found to be successful in planning for the learning disabled student's admission to and success in college.

By definition, the learning disabled are average or above average in intelligence and many clearly possess the potential for success in higher education. However, they may be at a different point from their non-learning disabled peers in the acquisition of academic content, in development of effective study skills, and in their own self awareness. A realistic approach in helping the learning disabled adolescent plan for college addresses each of these differences to enable the student to realize his/her true educational potential in the most appropriate setting.

Counselors working with seniors who are learning disabled have found the following assumptions useful:

- not every learning disabled student should go to college;
- there is a college program for every learning disabled student who has the potential and desire to go to college;
- if there is a special program for learning disabled at a particular college, it is only as good as the people directing it;
- supportive services at the college level are not needed by every learning disabled student, but those students who do require special services can still meet college level expectations.

Individual Profile

Specifically, guidance counselors for this group of students must collect and examine with the individual student and his/her parents an academic and emotional profile of the student. This includes:

- the complete academic records showing courses, levels, and grades;
- an indication of interests obtained from the Kuder Interest Survey or similar instruments;
- an intelligence assessment such as the WAIS-R (including verbal, performance, and full scale scores and results of individual subtests)
- an aptitude assessment such as the Differential Aptitude Test;
- an evaluation of actual day-to-day performance patterns based on written observations by teachers;
- an emotional profile collected from clinical files and observations.

Examined collectively, this information provides an integrated picture of the student's academic strengths and weaknesses, specific learning disabilities, and learning style. It also reflects any residual developmental lags academically, socially, or emotionally.

Additionally, the counselor and student should consider the following:

- the student's emotional acceptance of the learning disability;
- the student's intellectual understanding of the learning disability;

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- the severity of the learning disability;
- the ability to set realistic goals;
- the compensatory skills acquired;
- the amount of compensation still required;
- the depth of preparation in content areas.

Senior Year Sequence

Based on assessment of the preceding criteria, Hill Top Preparatory School has developed a carefully sequenced program for senior year students with the potential for college. The order of activities is:

- parent-meetings and conferences beginning in September and continuing throughout the year;
- after school SAT preparation classes;
- SAT testing in December and March;
- completion of personal statement and activities form;
- input from all teachers;
- college visitations by the senior class as a whole;
- visits to the school by college admissions representatives;
- visits to the college of choice by the individual student;
- submission of applications.

Hill Top students do not take SAT's until December of their senior year (although PSAT's are required in the junior year). Because this is a catch-up year, they need as much content exposure in the classroom as possible. To attempt the tests earlier would mean that many would not have mastered, or in some cases even practiced, the skills necessary to do well, thus creating unnecessary anxiety in the testing situation. Both standard and non-standard administrations are options.

Delaying SAT's and college applications provides time both for academic content acquisition and emotional growth. This facilitates realistic goal setting. To make a decision before a learning disabled adolescent is nearing completion of secondary work is premature and denies the student the opportunity to demonstrate his/her full potential. The Hill Top experience has been that the delayed timetable has not hindered the student's chances of being accepted into the college of choice in approximately 95% of the cases. Instead, with cumulative academic success and increased self-awareness, opportunities exist at that point that might not have been considered earlier.

Regularly scheduled group therapy is a critical part of the program at Hill Top. Included among the goals for these twice-a-week sessions are:

- heightening awareness of the student's strengths and weaknesses;
- developing communication skills;
- teaching the student how to set appropriate goals;
- teaching the student how to work with authority figures;
- assisting each student in assuming greater responsibility in both the academic arena and his/her emotional life;
- redirecting energy from defensive postures to creative academic and emotional behaviors.

Communication with parents is critical. Parents must be helped to "trust the process." Since the children of friends are usually following different college placement schedules, tremendous anxiety arises in the parents of learning disabled college bound students. They must be prepared to accept the time table most beneficial for their son/daughter.

College admission personnel have stated that one of the most important qualities that a college-bound learning disabled student can possess is the ability to describe the learning disability articulately and to present any special needs clearly. Parents frequently have a hard time allowing this to happen and need to be shown the benefits of such a procedure. Assistance must also be given to those who are so pleased with the progress of their son/daughter that they feel that there will be no further problems or special needs. Proper guidance in these cases can head off future upset for the student and family.

Personal Statement

Preparation of a personal statement by each senior is viewed as a crucial integrative activity. This requires the student to put into his/her own words what the learning disabilities are, what compensation skills have been acquired, and to generalize about personal experiences and aspirations in a concise one page format. This statement which is included in the student's permanent file is sent to any school to which the student applies. Reaction from the colleges has been uniformly positive because it gives the admissions committee additional information which they may not have learned from the personal interview. This is especially true if the student has a verbal expressive difficulty or if the interviewer is not familiar with the varying forms of learning disabilities.

College Visits and Applications

As a group, seniors at Hill Top visit three area colleges: a two year community college, a state university and a private university. This experience, which includes observing classes as well as meeting with admissions representatives, allows them to compare programs and provides valuable background for their own individual visits to colleges of their choices.

Hill Top solicits visits to the school by college representatives from a variety of institutions. Seniors are prepared for these sessions in a pre-visit meeting with the guidance counselor to provide them the opportunity to formulate appropriate questions. After each visit, time is allotted to clarify any information that may have been incorrectly or incompletely processed by a student.

Seniors are encouraged to initiate their college applications in January. By waiting until this time, they gain four important months of academic, emotional, and social growth. At Hill Top, the usual transcript profile reflects steady improvement, the December SAT scores are in, and stronger teacher/counselor recommendations are likely. Most colleges to which the students apply have rolling admissions policies or special arrangements are possible. These might include a student enrolling on a non-matriculated basis or starting as a part-time student. For some students, a "thirteenth year" in a transitional program may be recommended (See article on Transitional College Program). □

James Fisher is director of counseling and Deborah Sahijwani is college placement advisor at Hill Top.

A Personal Statement

The following is an example of a personal statement prepared by a recent Hill Top graduate.

I am 17 years old and presently a senior at Hill Top Preparatory School. I am interested in extending my education to a college level.

During my years at Hill Top, I have supported a foster child with my classmates, and I have been the manager of our school soccer team.

The subjects I am most interested in are English, math, and human development. Schoolwork has always been a struggle for me due to my learning disability. It has been diagnosed as a diffuse integrative learning problem. I have compensated for this by focusing my concentration, depending on my memorization ability, and setting deadlines to help me discipline myself.

Outside of school, I have tutored deprived black children from the city of Philadelphia. I have held summer jobs as a counselor at day camps in my area which I enjoyed wholeheartedly. I love working with children of all ages. It is an activity that gives me great pleasure and that I find exciting and educational. I consider myself physically active although competition against boys has made it hard for me to engage in school team sports. I am interested in and play all kinds of sports at the country club near my home. After school I take an aerobics class.

When I go to college, I hope to major in a field such as teaching, nursing, or social work. I would prefer working with disabled or handicapped children, since I would understand them more because of my own experience being learning disabled. □

Denise McGarry, Acting Director of Admissions for University College of Villanova University, discusses course selection with a Hill Top transitional student and Richard Nocella, director of the Transitional College Program.

Changing Role of Neurologists In Field of Learning Disabilities

by Edgar J. Kenton, III, M.D.

As right hemispheric deficient adolescents and adults are evolving in a world increasingly demanding perceptual skills, the role of the neurologist is changing from that of establishing the presence or absence of so-called hard signs of brain damage to the task of establishing the relevance of so-called soft signs in the learning disabled with particular emphasis on right hemispheric developmental disturbances for the acquisition of learning. Clinicians dealing with learning disorders have seen increases in recent years in referrals of those experiencing problems involving arithmetic, visuo-constructive skills and social disabilities.

This triad of deficiencies was noted by Rudel and her colleagues in 1974.(1) They noted not only left sidedness for dominance, but also oculomotor tracking deficits as neurological correlates of this behavioral triad. In patients with these deficiencies Rudel and Denckla(2), over a ten year period, observed responses from therapeutic intervention, but no benefits from eye movement training.

This triad of arithmetic, visuo-spatial, and social problems was discussed by Rourke in a recent issue of *Journal of Clinical Neuropsychology*.(3) He found central processing deficiencies in children who were developmentally deficient in right hemispheric capacities, noting that such children were deficient in attending to non-verbal cues and over-utilized programmatic, routinized language and socal situations.

In August of 1983, Weintraub and Mesulam of the Behavioral Neurology Section of the Boston Beth Israel Hospital and the Harvard Medical School reported in the *Archives of Neurology*(4) a review of developmental learning disabilities of the right cerebral hemisphere with particular regard to emotional, interpersonal and cognitive components. In a study of fourteen patients, they encountered a behavioral syndrome that begins in early life and is characterized by emotional and interpersonal difficulties, shyness, visuo-spatial disturbances, and inadequate paralinguistic communicative abilities. Though all patients had at least average intellectual capacity, each had demonstrated some academic failure, particularly in arithmetic. Studies revealed neurologic and neuropsychological signs consistent with right hemisphere dysfunction. The neurologic exam emphasized tests of fine motor control, the prosodic quality of speech, maintenance of eye contact and the use of gestures. Most of the patients avoided eye contact and lacked the gestures and prosody that normally accompany and accentuate speech. Eight of the patients reported a family history of similar symptoms. Consistent with these observations, the psychiatric issues evolved as central to the problem with chronic depression and/or extreme shyness, the two most frequently reported problems.

Just as developmental involvement of the left cerebral hemisphere may produce dyslexia, damage to the right hemisphere which occurs early in life or is inherited may lead to chronic emotional difficulties, disturbances of interpersonal skills and poor visuo-spatial ability. The issue of shyness and how it interferes with careers and social life was highlighted in the October 31, 1983, issue of *U.S. News and World Report*.(5) Surveys show that as many as forty per cent of adult Americans consider themselves shy, with respect to a general need to be tense, inhibited and awkward in social situations particularly in face-to-face interactions with strangers. Such surveys show that oral communication skill is the single most important personal characteristic necessary for advancement in a job and here shy people are at a disadvantage. The article notes a genetic component to shyness for about forty percent of adults and that early developing shyness is very much a physiological symptom of a particularly sensitive nervous system.

In 1874, Jackson noted that it is the left hemisphere of the human brain which predominantly controls certain aspects of language. In 1979, Heilman(6) noted that the right cerebral hemisphere is dominant over certain aspects of attention, intention and visual-spatial tasks. Galaburda of the Harvard Medical School(7), Neurological Unit, notes that since the 19th century, it has been known that brain development of the convolutions of the right hemisphere appear earlier than those on the left. The discovery that the cerebral cortex develops faster in certain regions on the right side of fetal life, despite the fact that already in the infant brain the left sided regions tend to be larger in the language areas, suggests that areas that develop faster arrest their development sooner whereas those that develop more slowly continue on and eventually reach a larger size. Galaburda notes a correlary hypothesis which would claim that a more slowly developing left language region would be relatively more vulnerable to interference by pathological processes over time. Therefore, left hemisphere malfunction would result more commonly than right.

Geschwind and Behan(8) have recently brought attention to an association between left handedness, learning disabilities and some auto-immune disorders. They have pointed out that in left handed subjects and their relatives, there is an increased incidence of learning disabilities as well as disorders such as auto-immune thyroid disease and migraine. Geschwind notes that since left handedness, learning disorders and superior right hemisphere skills are more common in males than in females, it would seem reasonable to look for some factor connected with male sex which retards growth of the left hemisphere in intrauterine life. During intrauterine life, there are enormous quantities of the male sex hormone, testosterone and the amount begins to rise as puberty approaches.

There is very extensive evidence showing that testosterone has major effects on the development of many parts of the nervous system.(9, 10, 11) The development of certain asymmetries in the brain of the rat is altered by early hormonal manipulation and cerebral dominance in the rat is altered by administration of testosterone to the mothers during pregnancy. There is also evidence that testosterone has important effects on the development of the immune system. Geschwind hypothesizes that during fetal life, testosterone slows the growth of the left hemisphere. When quantities are elevated, it is more likely to produce left handedness and in extreme cases, to lead to alterations in the left hemisphere which are responsible for the childhood learning disorders such as dyslexia. Excessive testosterone effects will also produce impairments in the development of the immune system which, therefore, make the individual more susceptible to later immune disorders. The work of Victor Denenberg and his colleagues(11) at the University of Connecticut on asymmetry in the brain of the rat has found that this asymmetry can be modified in important ways by the environment in which the animal lives in the postnatal period.

In recent years, studies have clearly defined the syndromes of aprosodia as difficulty in comprehending or expressing the emotional tone in speech usually asociated with an acute lesion of the right cerebral hemisphere. Such patients exhibit no difficulty in comprehending the meaning of words, producing normal, fully grammatical speech, naming or repetition, but may, have considerable difficulties in understanding the affective component of a statement, repeating a statement with appropriate affective intonation or spontaneously expressing emotion by means of intonation and gesture. Prosody refers to variation in tone and volume in language.

Bhatnagar and Andy(12) evaluated language function in the right non-dominant hemisphere in three patients undergoing cortical surgery for intractable seizures. During electrical stimulation of the cortex, these investigators presented three different levels of language complexity from lowest to highest: object naming, sentence completion and responsive naming. The greatest number of linguistic errors occurred with sentence completion. These investigators speculate that there is a right non-dominant language system that is anatomically and functionally tied to the left dominant system. They note that the right non-dominant language system is a passive one in contrast to the more actively involved left hemisphere. Thus, the language functions of the right hemisphere may be considered to be primarily rudimentary or simple and passively involved in normal conditions. The level of language complexity attainable by this hemisphere may be considered to be ontogenetically determined and subject to the relative integrity of the genetically determined left dominant language zone.

With continuing research in this area, the neurologist now joins the coalition of special education, child psychiatry, neuropsychology and developmental behavioral neurology investigating disorders of social cognition and social competence. Clinical diagnostic techniques and research measures are evolving to better understanding and manage such problems. □

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HILL TOP PREPARATORY SCHOOL

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Transitional College Program Supports LD Students' Entry To Fully Matriculated Status

by Richard Nocella, M.Ed.

Many learning disabled adolescents who receive a high school diploma are still significantly behind those who learn normally in mastery of learning strategies and in some content areas. Some who are ready for college level work in certain courses will also need a program that focuses on closing lingering educational gaps where they may exist. For example, a student reading below grade level but with conceptual abilities in math can progress to college math, but will need assistance at the secondary level to strengthen the reading skills.

The Transitional College Program was designed for the student who has the potential to be successful in higher education but who still requires substantial secondary work in areas of weakness. Over the past thirteen years, Hill Top Preparatory School, by special arrangement with nearby colleges and junior colleges, has offered this program to qualified students who have graduated from Hill Top. The program's success has resulted in expansion to include now graduates from other secondary schools.

In the program, students complete academic work at Hill Top in their areas of weakness while, at the same time, taking selected college courses for credit off the campus in areas of strength. The academic courses plus the extensive counseling which is an integral part of the program provide the student with the opportunity to enter college in a supportive environment at a pace allowing for success.

Admissions

Referrals for the Transitional College Program come from college admissions counselors, private and public school guidance counselors, therapists and parents. Acceptance into the program is based on the following:

- successful completion of a secondary school program with diploma;
- a basic competency level of 20th percentile in English, numerical competence, science, and social studies; and 30th percentile in reading and math on Part A of the Stanford Achievement Test (High School Battery) or a test of equal validity and reliability;
- a personal interview in which the following are assessed:
  —the student's ability to articulate present needs and goals;
  —the student's ability to evaluate current strengths and weaknesses;
  —the student's present level of communication skills;
  —the student's maturity level.
- a parent interview in which the following are assessed:
  —the parents' abilities to cooperate with the goals of the program;
  —the parents' current understanding of their student's need for the program.
- a psychological evaluation in which the following are assessed:
  —the student's potential for growth;
  —the present anxiety level of the student;
  —the willingness of the student to accept guidance;
  —the student's ability to tolerate meaningful frustration;
  —the student's ability to problem-solve;
  —the student's ability to set goals.
- the submission of three written letters of recommendation:
  —one from a content area teacher (English, math, science, or social studies);
  —one from a skill area teacher (physical education, art, shop, music, etc.);
  —one from an employer or adult (other than parent) with whom the candidate has worked on a project.

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Conference Announcement . . .

"Language and Communications Difficulties of the Learning Disabled Adolescent" is the theme of the fourth annual Hill Top Conference. Elizabeth H. Wiig, Ph.D., professor in the Department of Communications Disorders of Boston University, will be the keynote speaker for the conference scheduled for Saturday, November 3, 1984, at the Hill Top Preparatory School.

Edgar J. Kenton, III, M.D., chief, Division of Neurology at Lankenau Hospital and associate professor of clinical neurology at Thomas Jefferson University, will also address the topic from his professional perspective as will Moss A. Jackson, Ph.D., clinical psychologist and chief clinical consultant to Hill Top.

All three speakers will then focus on a specific case presentation which they will examine from their respective disciplines. Participation from those attending the conference will be encouraged at this point.

Persons wishing additional information may write Ann Denny at Hill Top Preparatory School, S. Ithan Ave. & Clyde Rd., Rosemont, PA, 19010 or call (215) 527-3230.

Transitional College Program *continued from page 5*

Program

The curriculum of the transitional program provides coursework in all content areas of weakness to enable the student to meet common standards for full matriculation in college. In addition, consultations with staff are provided to reinforce skills in the areas of strength. Special emphasis is placed on all reading, writing, and quantitative skills. Finally, prescriptively designed work is given in the following:

- organizational and independent study skills;
- informational retrieval skills;
- money and time management;
- self presentation skills;
- development of a personal statement and/or resume;
- elective courses stressing creative and thinking skills;
- computer literacy.

Each student participates in informal, individual counseling sessions on an as needed basis. Group counseling is provided on a formal basis with each student assigned to a group in which communication skills, problem solving skills and the development of goal setting abilities are emphasized. These groups have proven so useful that the students in the program have suggested adding a third session each week.

Graduates of the Transitional College Program have been admitted to regular college programs with advanced standing. To date, twenty-six students have successfully completed the program. Twenty-one achieved full matriculation status; two continued on a part-time basis; and three temporarily dropped out of school for various personal reasons.

A graduate of the program described the benefit of the year in this way: "The Transitional College year makes the difference between landing a plane with the landing gear down and landing with the wheels up and locked." □

Richard Nocella is director of the Transitional College Program at Hill Top.

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Understanding the Place of Math in Education of Learning Disabled

June Miller White, Ph.D.

Michael, age 12 with a 125 I.Q. reads on a third/fourth grade level. He does not know his multiplication facts, but has tested at a formal operations' level of cognitive skills. Michael is bored in the traditional classroom as teachers try to find a way to "cure his learning disability."

The truth is Michael is an intelligent and talented youngster for whom school will provide work usually only in areas in which he is weak. The academic program will be a deficit-driven model that generally will ignore his talents in other areas. For example, Michael probably will be drilled on multiplication facts in which he has a disability and he will be excluded from reasoning problems in which he has strength.

Most of our learning disabled "become increasingly depressed, disengaged, angry, and/or disturbed as any of us would under similar circumstances . . . Why have we held so rigidly to the idea that the purpose and promise of special education is to cure disabilities? Why, without a shred of confirming evidence, do we believe we can cure all reading problems and further, why do we continue trying to do so?" (Poplin, 1984)

Many learning disabled have talents and aptitudes for mathematical thinking although they may have deficits in memorization of discrete facts and techniques which appear to them unrelated to practical applications. Instruction in mathematics must focus on the cognitive strengths in mathematical reasoning and provide conceptional and academic background needed for success in higher education mathematics and careers.

Background

To understand the place of mathematics in the education of the learning disabled, educators need to examine the goals for schools. After a three and one-half year study commissioned by the Carnegie Corporation of New York, Charles Silberman made his goals of education very clear. He wrote in his 1970 book. *Crisis In the Classroom:*

> "To be practical an education should prepare them for work that does not yet exist and whose nature cannot even be imagined. This can only be done by teaching them how to learn, by giving them the kind of intellectual discipline that will enable them to apply man's accumulated wisdom to new problems as they arise, the kind of wisdom that will enable them to recognize new problems as they arise." (Silberman, 114)

In a 1984 book, *Horace's Compromise: The Dilemma of the American High School,* Horace Sizer, former dean of the Harvard University Graduate School of Education and currently chairman of the Brown University Department of Education, wrote that instruction needs to be geared toward assisting students in discovering and discussing rather than merely accumulating random pieces of information. As early as 1929 Alfred Whitehead wrote: "The aid of education is the acquisition of the utilization of knowledge." (Whitehead, 16)

From 1929 to 1984 educational leaders have stressed that education needs to prepare students to learn throughout their lives. It needs to prepare persons to educate themselves and to have both the desire and capacity to learn for themselves. You cannot distinguish an educated person from an uneducated person by noting their beliefs. You can distinguish by asking them questions. The educated person will know how to take hold of the question.

Silberman pointed out that educators need to prepare students not only to earn a living, but also to live a creative, humane, and sensible life. Students need to know how to apply their knowledge to life. Acquiring knowledge, learning how to learn, and knowing how to apply knowledge

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Understanding the Place of Math

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are goals of all education, but they are especially pertinent to the learning disabled population for whom these skills will not often be acquired without intensive involvement on the part of the educators.

Acquiring Knowledge

Because many learning disabled are language disabled, their education has often focused on reading and language arts. Most learning disabled in special education will learn to read and comprehend, although many may never read for pleasure. Often their reading will be word-for-word without much success at skimming. Mathematics and the sciences are disciplines which require this type of reader.

Educators must provide opportunities for the learning disabled adolescents to study the traditional secondary mathematics courses which are prerequisites for careers such as computer science. To deny learning disabled students access to these prerequisites is to close the door on many higher educational and career opportunities. Students without knowledge of secondary mathematics are limited in their potential for earning a living. They are prevented from further work in the very field which takes advantage of their reading style and often their learning style.

Many learning disabled students appear weak in mathematics ability because of gaps in their background, not because of a lack of aptitude for mathematics. The frustration a student has experienced in the past comes more from weakness in background than from any lack of cognitive skills. This is not to ignore the fact that many learning disabled are frustrated with what they describe as "I'm no good at math."

Studies (White, 1985; Sinicrope and Mick, 1983) have reported that comparisons of learning disabled with non-learning disabled show no significant differences in reasoning skills, but real differences in language skills. In Piagetian terms, learning disabled reach the stage of formal relations about the same time as non-learning disabled. The learning disabled, however, often cannot describe the process. Sometimes this results in miscommunication since the teacher may think the student cannot do something when, in reality, he/she simply cannot describe it using words.

This often means that a language disabled student who is taught primarily through verbal presentations will have accumulated many minor misunderstandings whose cumulative effect will be a major problem. Because of the sequential nature of mathematics the small difficulties create deficiencies in every problem in which they are utilized. This gets compounded until major difficulties occur and the student may stop trying. To the student it appears hopeless when in reality there are often gaps in the background in which instruction needs to take place. For example, students who have yet to master regrouping in subtraction will not be able to do long division well since one part of it assumes knowledge of subtraction. Students who have problems with division will encounter more problems in finding common denominators for fractions. Students who cannot get common denominators will have difficulties adding and subtracting fractions with unlike denominators.

Learning How to Learn

The sequential nature of math can create enormous difficulties for students with gaps in their backgrounds. It also can create opportunities for teaching students to learn how to learn. It can demonstrate to students the usefulness of previous topics. Using the division model, for example, each of 35 students must pay an equal share for a hoagie order that totaled $71.05. How much is each share? Sequencing within a single problem can demonstrate how to attack the problem. What do I do first? What do I do second?

The logical aspect of mathematics provides ways to acquire analytical skills. What is the problem really asking me to find? What information is relevant? Teaching good mathematics is teaching students an approach, an attack, a style for dealing with questions. This is a distinguishing characteristic of the educated.

A mathematical point of view requires an approach that will look at information, look at alternatives and then analyze the problem. For example, a student is asked to find the cost of 23 tickets at $11.50 for each. What do I want to find? The cost of 23 tickets. What do I know? The cost of one ticket. How will I use this information to reach an answer? Do you remember how to multiply 23x$11.50?

Applying Knowledge

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1. Resources (tools of the trade including heuristics), accessing knowledge stored in long term memory,
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Often we teach for knowledge and resources without control and belief. This results in students who think math is a waste since they do not believe it is useful. How important is it to know how to divide ¾ by 2? We have been drilled on the technique: $¾ - 2 = ¾ X ½ = ⅜$.

Students learn the mechanics, but never believe it useful. They think, "Mine is not to reason why, but to invert and multiply." This is a resource, it is knowledge accessed from long term memory. Only when the student can apply the knowledge does it become useful. For example, a student made brownies but wanted to cut the recipe into two equal parts, division by 2. How do you divide ¼ cup of sugar into two equal parts? Control and belief would mean that you would apply your resources believing it to be useful: $¼ - 2 = ¼ X ½ = ⅛$.

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Transactional Analysis Model Improves Classroom Communication

James H. Fisher, M.Div.

The transactional analysis model can be used to increase effective communication in the classroom. This model involves the Internal Parent, Ⓟ, the Internal Adult, Ⓐ, and the Internal Child, Ⓒ, found within all of us.

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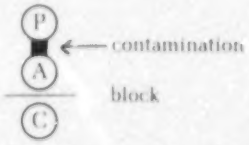
Patterns of Transactions

All of life's experiences provide information for the developing young person and consequently certain patterns begin to develop within the person. For example, there can be a pattern in which the Internal Adult is contaminated by the Internal Parent and the Internal Child is blocked out.



In general, this type of person is dominated by Internal Parent statements or "shoulds" and "oughts." His/her life is based on what other people have said, including perceived expectations of society. Simultaneously, the person is not in touch with his/her feelings. He/she may have learned not to express feelings because of inappropriateness such as boys or men do not cry. This pattern results in a person functioning in a less than human way. He/she is not his/her own person.

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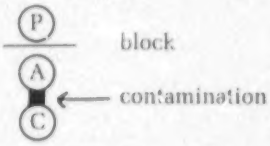
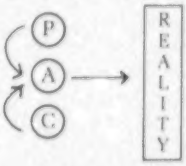


This pattern produces an adult who has never grown up. He/she tends to act impulsively and the behavior is based mostly on feelings.

Effective patterns develop when the Internal Adult checks out the reality of any situation and makes a response appropriate to that situation.



The Internal Adult "calls up" the Internal Child if that is appropriate and the Internal Adult "calls up" the Internal Parent if that is appropriate.

Classroom Use of Model

In the classroom it is assumed that one of the teacher's functions is to assist the student to *think* for him/herself. The teacher may find using the transactional analysis model to be an effective aid in reaching this objective. For this model to work the teacher must first be aware of his/her own style of communication and understand how his/her own Internal Parent, Internal Child, and Internal Adult function.

Once this understanding is accomplished, the teacher's goal is to get the Internal Adult of the student to function. This transaction is an initial step:

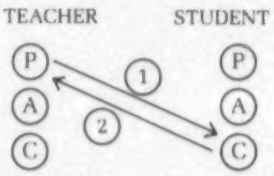
(1) Teacher: "Open your book to 47."

(2) Student: Opens book to page 47.

The teacher's Internal Parent initiates a message to the student's Internal Child and the student responds from his/her Internal Child to the Internal Parent of

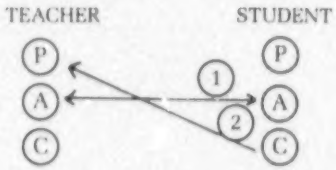
Contributors to this issue of **Spectrum** are June M. White, Ph.D., James H. Fisher, M.Div., and Elissa L. Fisher, Ed.M.

the teacher. The teacher is acting as a parent and the student responds as a child in an obedient way without any question or comment.



This transaction is also the traditional communication style of a teacher-centered school as opposed to a student-centered one.

The teacher who asks more questions than gives directives is more likely to have a style that will encourage the student to think and work out of his/her Internal Adult. Sometimes these transactions are crossed as in the following example.



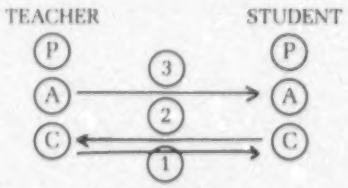
This crossed transaction has the effect of initially "jamming the student's tapes," i.e. the student receives the information in such a way that it prevents the student from responding as he/she normally would.

(1) Teacher: "Joanie, how do we solve this problem?"

(2) Student: "I don't remember this assignment. What page should I look on?"

The teacher wants the student to risk thinking and finding the right answer or solution. The student wants the teacher or the book to give the right answer or solution. From the teacher's perspective, it is all right to "jam the student's tapes," to "knock him/her off center," if the teacher wants the student to learn how to think and problem solve for him/herself.

A possible second transaction following the above might be:



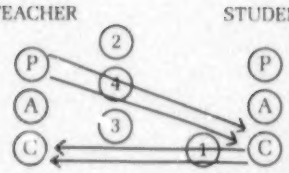
The teacher joins the student's feeling and acknowledges that feeling. Once the student knows it is all right to have that feeling, he/she continues to think and work and possibly ask more questions which activate his/her Internal Adult.

(1) Teacher: "I see you are upset at not having the answer right away and it may make you feel stupid."

(2) Student: "Did you ever feel this way when you went to school?"

The teacher responds to the student with the discussion of feelings. Then the teacher asks the question again.

(3) Teacher: "What do you think the first step is?" Another cross-transaction is the following:



① Student: "I hate this class!"

② Teacher: "Be quiet; no more noise in this room."

(The teacher is not attentive to the real problem.)

③ Student: "I hate you!"

④ "I won't stand for this in my classroom. You have a detention."

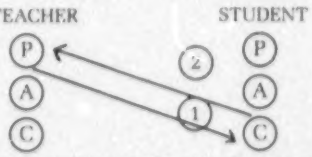
The teacher has been "hooked", i.e., cannot respond as an adult. The teacher could have responded Ⓒ to Ⓒ acknowledging upset so transaction ② would have been, "I can see you're really upset," or Ⓐ to Ⓐ, "This class is getting disruptive. What is taking place?" These responses allow students to think. The teacher also could respond Ⓟ to Ⓐ, "Stop for a minute. What seems to be the problem?"

The goal in all transactions is to get the students to assume responsibility for their behavior and to activate their Internal Adult.

Teachers create more problems when they operate only from one mode. If teachers are only Ⓟ to Ⓒ all the time, the interactions keep the students in a dependent relationship. Students then initiate power struggles in order to manipulate the teacher. This is not to say that Ⓟ to Ⓒ is never used. It can be used in situations such as the following:

(1) Student: "I can't find the page."

(2) Teacher: "Here, let me help you."



To communicate effectively, teachers need to be aware of their own styles. The key to motivation for learning is activation of the Internal Adult of each student in such a way that the individual begins to assume responsibility for his/her own learning. □

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James H. Fisher, M.Div., is director of counseling at Hill Top Preparatory School.

Pedagogical Defects Contribute to LD's Lack of Success in Math

Elissa L. Fisher, Ed.M.

In 1966, Luria set forth guidelines for observing math behaviors that allowed us to cluster them in such a way that we could begin to discuss four basic math disabilities: defects in logic; defects in planning; perseveration; and the inability to perform simple calculations. (Luria, 1966)

Today's teachers of math disabled students could add five more defects of significance: defects in the ability to sequence; defects in following directions; defects in memory; defects in staying focused on the task (Ross, 1976); and defects in handling the language of math (Ansara, 1973).

Defects in pedagogy may in fact compound the disabilities already experienced by these students. A primary defect is in the educational delivery service that fails to understand dynamics within it that directly contribute to a learning disabled student's lack of success in math.

The check list below draws our attention to these failures:

1. Failure to understand that all education must be diagnostic and prescriptive.
2. Failure to embrace the position that in every classroom developmental, remedial, compensatory, and adaptive skills must be taught.
3. Failure to work on the development of math concepts, computation and application at the same time.
4. Failure to teach the language and the ecology of math while appreciating the semantic environment.
5. Failure to involve the child orally in the learning process.
6. Failure to utilize task and protocol analysis. (Hughes, 1982)
7. Failure to emphasize process.
8. Failure to present material in a manner that takes into account the need for learning bridges.
9. Failure to adjust the educational environment and materials used initially to meet the student's needs. (Cruickshank, 1968)
10. Failure to move at a pace commensurate with the learning pace.
11. Failure to prevent repetition that reinforces error rather than eliminating it.
12. Failure to take progression cues from the student.
13. Failure to allow for consolidation time and over-learning.
14. Failure to understand that the teacher must guard against involving students mathematically who may be hyperactive, distractible, and/or perseverative in a manner that causes them to become lost in the activities. (Cruickshank, 1968)
15. Failure of the teacher to see him/herself as a flexible facilitator rather than as a dispenser of correct answers.
16. Failure to understand that math education like all education must take into account that the brain functions as a system.

When we as educators avoid these failures in our planning and delivery service as well as the erroneous assumption that learning disabled students will never be good math students, we see students who regardless of type of disability have a much greater opportunity for not just survival in math, but success. □

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Elissa L. Fisher, Ed.M., is founder and director of Hill Top Preparatory School.

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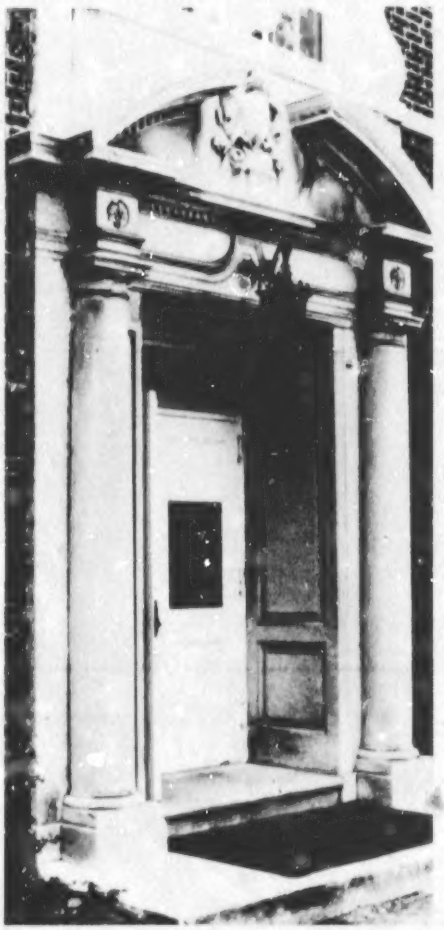

HILL TOP SPECTRUM

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continued from page 2

new problems and new situations with a strategy for finding a solution. □

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June M. White, Ph.D., the editor of Spectrum, is consultant for research and publications for Hill Top Preparatory School. She also chairs the department of mathematics at St. Petersburg Junior College in Florida.

(This article, as are the other articles in this issue of Spectrum, is an excerpt from a presentation given at the course, "An Irreverent Look at Mathematics and a Serious Program of Math Education for the Learning Disabled Adolescent," July, 1984.)

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Understanding the Place of Math in Education of Learning Disabled

June Miller White, Ph.D.

Michael, age 12 with a 125 I.Q., reads on a third/fourth grade level. He does not know his multiplication facts, but has tested at a formal operations' level of cognitive skills. Michael is bored in the traditional classroom as teachers try to find a way to "cure his learning disability."

The truth is Michael is an intelligent and talented youngster for whom school will provide work usually only in areas in which he is weak. The academic program will be a deficit-driven model that generally will ignore his talents in other areas. For example, Michael probably will be drilled on multiplication facts in which he has a disability and he will be excluded from reasoning problems in which he has strength.

Most of our learning disabled "become increasingly depressed, disengaged, angry, and/or disturbed as any of us would under similar circumstances . . . Why have we held so rigidly to the idea that the purpose and promise of special education is to cure disabilities? Why, without a shred of confirming evidence, do we believe we can cure all reading problems and further, why do we continue trying to do so?" (Poplin, 1984)

Many learning disabled have talents and aptitudes for mathematical thinking although they may have deficits in memorization of discrete facts and techniques which appear to them unrelated to practical applications. Instruction in mathematics must focus on the cognitive strengths in mathematical reasoning and provide conceptional and academic background needed for success in higher education mathematics and careers.

Background

To understand the place of mathematics in the education of the learning disabled, educators need to examine the goals for schools. After a three and one-half year study commissioned by the Carnegie Corporation of New York, Charles Silberman made his goals of education very clear. He wrote in his 1970 book, *Crisis In the Classroom:*

> "To be practical an education should prepare them for work that does not yet exist and whose nature cannot even be imagined. This can only be done by teaching them how to learn, by giving them the kind of intellectual discipline that will enable them to apply man's accumulated wisdom to new problems as they arise, the kind of wisdom that will enable them to recognize new problems as they arise." (Silberman, 114)

In a 1984 book, *Horace's Compromise: The Dilemma of the American High School,* Horace Sizer, former dean of the Harvard University Graduate School of Education and currently chairman of the Brown University Department of Education, wrote that instruction needs to be geared toward assisting students in discovering and discussing rather than merely accumulating random pieces of information. As early as 1929 Alfred Whitehead wrote: "The aid of education is the acquisition of the utilization of knowledge." (Whitehead, 16)

From 1929 to 1984 educational leaders have stressed that education needs to prepare students to learn throughout their lives. It needs to prepare persons to educate themselves and to have both the desire and capacity to learn for themselves. You cannot distinguish an educated person from an uneducated person by noting their beliefs. You can distinguish by asking them questions. The educated person will know how to take hold of the question.

Silberman pointed out that educators need to prepare students not only to earn a living, but also to live a creative, humane, and sensible life. Students need to know how to apply their knowledge to life. Acquiring knowledge, learning how to learn, and knowing how to apply knowledge

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Understanding the Place of Math

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are goals of all education, but they are especially pertinent to the learning disabled population for whom these skills will not often be acquired without intensive involvement on the part of the educators.

Acquiring Knowledge

Because many learning disabled are language disabled, their education has often focused on reading and language arts. Most learning disabled in special education will learn to read and comprehend, although many may never read for pleasure. Often their reading will be word-for-word without much success at skimming. Mathematics and the sciences are disciplines which require this type of reader.

Educators must provide opportunities for the learning disabled adolescents to study the traditional secondary mathematics courses which are prerequisites for careers such as computer science. To deny learning disabled students access to these prerequisites is to close the door on many higher educational and career opportunities. Students without knowledge of secondary mathematics are limited in their potential for earning a living. They are prevented from further work in the very field which takes advantage of their reading style and often their learning style.

Many learning disabled students appear weak in mathematics ability because of gaps in their background, not because of a lack of aptitude for mathematics. The frustration a student has experienced in the past comes more from weakness in background than from any lack of cognitive skills. This is not to ignore the fact that many learning disabled are frustrated with what they describe as "I'm no good at math."

Studies (White, 1985; Sinicrope and Mick, 1983) have reported that comparisons of learning disabled with non-learning disabled show no significant differences in reasoning skills, but real differences in language skills. In Piagetian terms, learning disabled reach the stage of formal relations about the same time as non-learning disabled. The learning disabled, however, often cannot describe the process. Sometimes this results in miscommunication since the teacher may think the student cannot do something when, in reality, he/she simply cannot describe it using words.

This often means that a language disabled student who is taught primarily through verbal presentations will have accumulated many minor misunderstandings whose cumulative effect will be a major problem. Because of the sequential nature of mathematics the small difficulties create deficiencies in every problem in which they are utilized. This gets compounded until major difficulties occur and the student may stop trying. To the student it appears hopeless when in reality there are often gaps in the background in which instruction needs to take place. For example, students who have yet to master regrouping in subtraction will not be able to do long division well since one part of it assumes knowledge of subtraction. Students who have problems with division will encounter more problems in finding common denominators for fractions. Students who cannot get common denominators will have difficulties adding and subtracting fractions with unlike denominators.

Learning How to Learn

The sequential nature of math can create enormous difficulties for students with gaps in their backgrounds. It also can create opportunities for teaching students to learn how to learn. It can demonstrate to students the usefulness of previous topics. Using the division model, for example, each of 35 students must pay an equal share for a hoagie order that totaled $71.05. How much is each share? Sequencing within a single problem can demonstrate how to attack the problem. What do I do first? What do I do second?

The logical aspect of mathematics provides ways to acquire analytical skills. What is the problem really asking me to find? What information is relevant? Teaching good mathematics is teaching students an approach, an attack, a style for dealing with questions. This is a distinguishing characteristic of the educated.

A mathematical point of view requires an approach that will look at information, look at alternatives and then analyze the problem. For example, a student is asked to find the cost of 23 tickets at $11.50 for each. What do I want to find? The cost of 23 tickets. What do I know? The cost of one ticket. How will I use this information to reach an answer? Do you remember how to multiply 23x$11.50?

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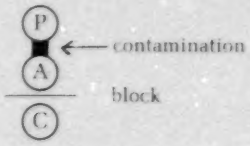

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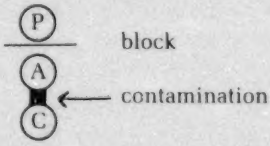
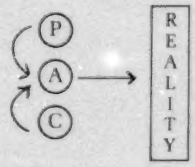


This pattern produces an adult who has never grown up. He/she tends to act impulsively and the behavior is based mostly on feelings.

Effective patterns develop when the Internal Adult checks out the reality of any situation and makes a response appropriate to that situation.



The Internal Adult "calls up" the Internal Child if that is appropriate and the Internal Adult "calls up" the Internal Parent if that is appropriate.

Classroom Use of Model

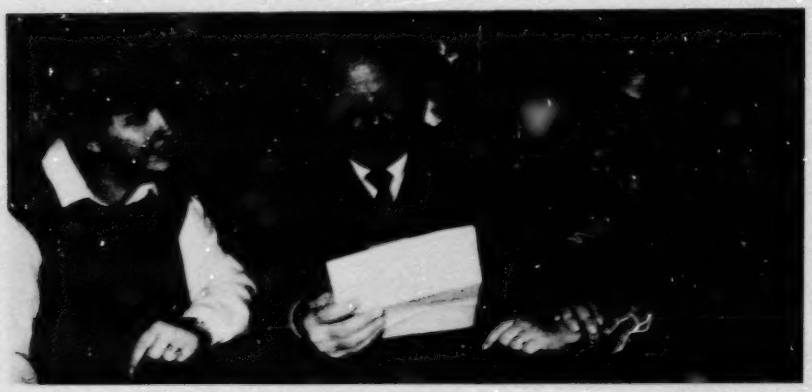
In the classroom it is assumed that one of the teacher's functions is to assist the student to *think* for him/herself. The teacher may find using the transactional analysis model to be an effective aid in reaching this objective. For this model to work the teacher must first be aware of his/her own style of communication and understand how his/her own Internal Parent, Internal Child, and Internal Adult function.

Once this understanding is accomplished, the teacher's goal is to get the Internal Adult of the student to function. This transaction is an initial step:

(1) Teacher: "Open your book to 47."

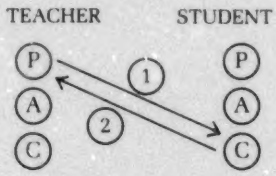
(2) Student: Opens book to page 47.

The teacher's Internal Parent initiates a message to the student's Internal Child and the student responds from his/her Internal Child to the Internal Parent of



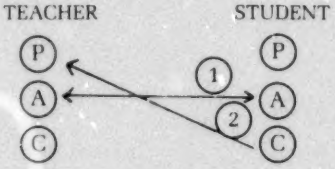
Contributors to this issue of **Spectrum** are June M. White, Ph.D., James H. Fisher, M.Div., and Elissa L. Fisher, Ed. M.

the teacher. The teacher is acting as a parent and the student responds as a child in an obedient way without any question or comment.



This transaction is also the traditional communication style of a teacher-centered school as opposed to a student-centered one.

The teacher who asks more questions than gives directives is more likely to have a style that will encourage the student to think and work out of his/her Internal Adult. Sometimes these transactions are crossed as in the following example.



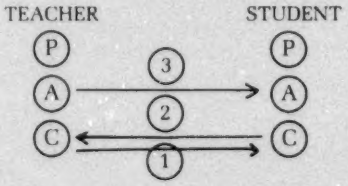
This crossed transaction has the effect of initially "jamming the student's tapes," i.e. the student receives the information in such a way that it prevents the student from responding as he/she normally would.

(1) Teacher: "Joanie, how do we solve this problem?"

(2) Student: "I don't remember this assignment. What page should I look on?"

The teacher wants the student to risk thinking and finding the right answer or solution. The student wants the teacher or the book to give the right answer or solution. From the teacher's perspective, it is all right to "jam the student's tapes," to "knock him/her off center," if the teacher wants the student to learn how to think and problem solve for him/herself.

A possible second transaction following the above might be:



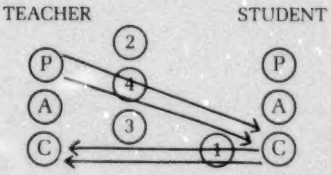
The teacher joins the student's feeling and acknowledges that feeling. Once the student knows it is all right to have that feeling, he/she continues to think and work and possibly ask more questions which activate his/her Internal Adult.

(1) Teacher: "I see you are upset at not having the answer right away and it may make you feel stupid."

(2) Student: "Did you ever feel this way when you went to school?"

The teacher responds to the student with the discussion of feelings. Then the teacher asks the question again.

(3) Teacher: "What do you think the first step is?" Another cross-transaction is the following:



(1) Student: "I hate this class!"

(2) Teacher: "Be quiet; no more noise in this room."
(The teacher is not attentive to the real problem.)

(3) Student: "I hate you!"

(4) "I won't stand for this in my classroom. You have a detention."

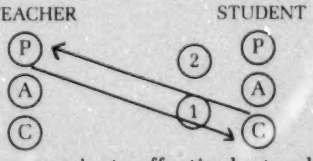
The teacher has been "hooked", i.e., cannot respond as an adult. The teacher could have responded Ⓒ to Ⓒ acknowledging upset so transaction (2) would have been, "I can see you're really upset," or Ⓐ to Ⓐ, "This class is getting disruptive. What is taking place?" These responses allow students to think. The teacher also could respond Ⓟ to Ⓐ, "Stop for a minute. What seems to be the problem?"

The goal in all transactions is to get the students to assume responsibility for their behavior and to activate their Internal Adult.

Teachers create more problems when they operate only from one mode. If teachers are only Ⓟ to Ⓒ all the time, the interactions keep the students in a dependent relationship. Students then initiate power struggles in order to manipulate the teacher. This is not to say that Ⓟ to Ⓒ is never used. It can be used in situations such as the following:

(1) Student: "I can't find the page."

(2) Teacher: "Here, let me help you."



To communicate effectively, teachers need to be aware of their own styles. The key to motivation for learning is activation of the Internal Adult of each student in such a way that the individual begins to assume responsibility for his/her own learning. □

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Pedagogical Defects Contribute to LD's Lack of Success in Math

Elissa L. Fisher, Ed.M.

In 1966, Luria set forth guidelines for observing math behaviors that allowed us to cluster them in such a way that we could begin to discuss four basic math disabilities: defects in logic; defects in planning; perseveration; and the inability to perform simple calculations. (Luria, 1966)

Today's teachers of math disabled students could add five more defects of significance: defects in the ability to sequence; defects in following directions; defects in memory; defects in staying focused on the task (Ross, 1976); and defects in handling the language of math (Ansara, 1973).

Defects in pedagogy may in fact compound the disabilities already experienced by these students. A primary defect is in the educational delivery service that fails to understand dynamics within it that directly contribute to a learning disabled student's lack of success in math.

The check list below draws our attention to these failures:

1. Failure to understand that all education must be diagnostic and prescriptive.
2. Failure to embrace the position that in every classroom developmental, remedial, compensatory, and adaptive skills must be taught.
3. Failure to work on the development of math concepts, computation and application at the same time.
4. Failure to teach the language and the ecology of math while appreciating the semantic environment.
5. Failure to involve the child orally in the learning process.
6. Failure to utilize task and protocol analysis. (Hughes, 1982)
7. Failure to emphasize process.
8. Failure to present material in a manner that takes into account the need for learning bridges.
9. Failure to adjust the educational environment and materials used initially to meet the student's needs. (Cruickshank, 1968)
10. Failure to move at a pace commensurate with the learning pace.
11. Failure to prevent repetition that reinforces error rather than eliminating it.
12. Failure to take progression cues from the student.
13. Failure to allow for consolidation time and over-learning.
14. Failure to understand that the teacher must guard against involving students mathematically who may be hyperactive, distractible, and/or perseverative in a manner that causes them to become lost in the activities. (Cruickshank, 1968)
15. Failure of the teacher to see him/herself as a flexible facilitator rather than as a dispenser of correct answers.
16. Failure to understand that math education like all education must take into account that the brain functions as a system.

When we as educators avoid these failures in our planning and delivery service as well as the erroneous assumption that learning disabled students will never be good math students, we see students who regardless of type of disability have a much greater opportunity for not just survival in math, but success. □

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HILL TOP PREPARATORY SCHOOL

HILL TOP SPECTRUM

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Strategies Training Provides Tool for Language Learning Disabled

by Elisabeth H. Wiig, Ph.D.

(This article represents a transcription of points made in a lecture presentation during the Hill Top Conference on "Language and Communications Disorders of the Learning Disabled Adolescent," November 3, 1984.)

Need for Strategies Training

Developing strategies for effective verbal communication is very necessary training for the language learning disabled individual because strategies are not acquired developmentally as they are by youngsters with normal communication abilities. After eleven or twelve years of age the learning disabled need to be switched from skills teaching to strategy teaching so that the language learning disabled individual can move on to the next step of development and performance.

Children, eleven or twelve years old, with normal language communication abilities can express positive as well as negative ideas, feelings, concerns, reactions, attitudes, and intents in appropriate verbal terms. They do not have to convey their messages with action. They can make themselves clear by warning you as they become more and more negatively inclined, as they get angry, or more and more positively inclined as they fall in love. They can present, understand, and respond to information in spoken messages related to persons, objects, events, or processes not immediately visible. For example, they can get messages on relationships out of a novel. They can see characterizations and relationships out of a dialogue, as in a play. They basically can analyze the dynamics of what is going on. They are ready for fully operational cognitive processes. They can take the role of another person effectively. They can take another person's perspective so that when they take that role, they have a fix on the person's personality characteristics, who the person is, how the person usually reacts, what might be an unusual reaction.

Individuals with normal language development can also give and understand complex referential messages. Not only can they understand the verbal messages, but they can write them too. They can take messages for and from other people. They can take notes in the classroom from a lecture and can reconstruct the underlying dynamics and cognitive structure of it. They can also adapt their messages to others so that the messages meet their needs; that is, they can elaborate, paraphrase, repeat. They can approach conversations and verbal interactions with expectations of what to say, how to say it, and when to say it, based on prior experiences in dealing with others or on observation of social interactions by others.

Individuals with normal language abilities can select different forms of communication depending on with whom they are talking. They can react according to the situation. They can talk one way with their friends, another way to the bus driver, a third way to a policeman, and a fourth way to the lady at Bloomingdale's. It is exactly this flexibility and the capacity to immediately take stock of a situation and say, "My best strategy in this case is to . . ." that distinguishes them from learning disabled individuals. The language learning disabled individuals cannot select different forms for their messages based on the age, status, and nonverbal and verbal reactions of listeners. They have problems basically with: "What do I say?" "How do I say it?" and "What is the timing?" Because they cannot anticipate, they lose their flexibility and therefore become reactive, rather than proactive. For example, when confronting a situation, an individual with normal communication abilities sets up strategies on how to deal with it. This person sets up scenarios outlining what to say if the other person says thus and such. Individuals can also set up different scenes based on which of their personal perspectives they want to take. Setting up such "scripts" is having the ability to anticipate what is going

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Tri-Dimensional Model Examines Content, Process in Communication

by Moss A. Jackson, Ph.D.

In the movie "The Music Man," several salesmen are traveling by train across the Midwest talking about the perils and prerequisites for successful selling. After much discussion of a salesman named Harold Hill and his string of recent successes, they come to the conclusion that in order to be a successful salesman one must "know the territory."

When a parent or teacher is faced with a learning disabled adolescent who is experiencing task difficulty and displaying resistant, defiant or task avoidant behavior, the adult may assume he/she knows what is going on. Frequently, this "knowing" point of view triggers a labeling of the teenager as unresponsive and/or uncooperative. Unfortunately, the adult may then be perceived by the teenager as a victimizer, rigid, stupid or one who "does not get what is really going on."

Engaged in a mutually critical or blaming pattern, the adult and teenager positions harden, a power struggle ensues and both participants become eventual losers. Both lose to the extent that either or both feel misunderstood, feel bullied into surrendering, or lapse into a communication cutoff where there is no more discussion or follow up. Often mistrust, reduced sense of competence, and dissatisfaction follow. What was supposed to be a fruitful discussion ends up in a mutual failure.

To communicate effectively with the learning disabled teenager, one must "know the territory," both at the surface levels (content) and at the underground levels (process). For example, when Robert, age 15, reacts impatiently and irreverently in class with his typical "This test is stupid" or "You're dumb," the surface meaning is clear. Robert does not like what is going on and is attacking either the test or the person giving it. On a deeper level he may be experiencing something quite different, e.g. "I can't make sense out of these questions" or "I don't know what is going on and I feel stupid."

In this case, depending on what communication level the adult is responding to, considerable differences in outcome will result. If the adult senses what the adolescent may be experiencing at the process level, he/she will be able to diffuse a potentially antagonistic dialogue and help the youngster recognize the basic source of the upset, such as feeling frustrated or incompetent. This moves the youngster toward greater mastery in that situation.

In order to stay focused and to accomplish this demanding task, one requires a flexibility in approach, a sturdy sense of him/herself and a good sense of humor. In addition, a communication road map of the territory might come in handy. Toward this goal the Tri-Dimensional Model of Communication Effectiveness is outlined in the following section. Briefly, the Tri-Dimensional Model consists of 1) the nature of the learning disability, 2) the affective defensive process, and 3) communication technique selection and delivery style.

The Nature of the Learning Disability

Many learning disabled adolescents experience difficulty in learning and/or social situations due to a language/communication dysfunction. For example, someone with a receptive language disability might have difficulty understanding the information being presented or discussed. If an integrative problem is present, he/she might not be able to understand or make sense out of what has been heard or seen. Or, if he/she possesses an expressive problem, he/she could easily communicate in an inarticulate or inappropriate manner. The teenager may also have difficulty in cognitive efficiency, particularly in the areas of sequencing, seeing how parts are related to the whole, short-term memory, inferential thinking, antecedent-consequent awareness, anticipatory thinking, and divergent thinking. Without a working familiarity with these cognitive skills or deficits, the adult will be handicapped in communicating with the learning disabled person.

Affective-Defensive Pattern

When one does not know what is going on, frustration and emotional arousal are apt to be experienced. In a situation where the teenager is experiencing communication dysfunction, he/she may suffer increasing levels of stress which in turn trigger automatic responses designed to cope with emotional upset. For the learning disabled adolescent who has experienced chronic frustration, failure and misunderstanding, the stress reaction and subsequent response pattern can be difficult for both him/her and others to handle. Often the level of emotional reactivity can be so great as to shut down reality-testing skills and may trigger an eruption of anxiety and defensive behaviors. He/She may feel a threat to security or experience physical changes, e.g. rapid breathing, increased heartbeat, muscular tension and other signs of emotional arousal that allow a regressive reaction to emerge.

For example, a situational upset involving a parent asking a teenage son, Robert, why he did not complete something that he said he would, such as a household chore or homework assignment, could trigger an explosive retort such as "Leave me the f . . . alone! You're always on my back!" Typically, this language would be a red flag for the parent and a subsequent military skirmish would follow.

If one were to know, however, from previous experiences that Robert has an integrative thinking problem, experiences difficulty in keeping track of his responsibilities and is lead hither-and-yon by his impulses, one might expect him to easily forget a task or misread a situation. The underground territory involving Robert's thinking, perceptual and emotional patterns may be so highly volatile and charged that a communication directive for him to simply "take care of the job that you were supposed to take care of two hours ago" could provoke an unnecessarily defensive and reaction on his part. It might be advantageous for the adult to set the stage in such a way as to minimze Robert's explosive retort. His father could say, "Robert, I want to check something with you. It will just take a moment.

The garbage has not been taken out and I want to remind you of your job. I know you have been busy and might have forgotten. Please take care of it. Thanks." This is direct yet supportive; simple yet complete; the problem is kept in a task-oriented context and maintains an air of respect.

Even under the best of intentions and circumstances, tempers can easily flare and the adolescent may lash out verbally and blame someone else. In this case, the adult needs to have some additional communication strategies handy to cope with the youngster's defensive posture.

Communication Technique: Selection and Delivery Style

Content and Process Communication occurs on two levels: content and process. While any particular message might appear clear and direct, such as "It's your turn to clear the dishes" or "Turn down the music; it's too loud," the learning disabled adolescent might not respond accordingly. If he/she does not comply, acts in a sullen, passive-aggressive or avoidant manner, the adult must choose between staying in the content level, e.g. the task the teenager is directed to do, or shifting to a process approach and taking the exchange to a deeper level of communication.

For example, Robert yells back, "Why are you picking on me about the dishes? You never criticize my sister, the princess!" His father can initially answer: "You're feeling picked on and think that I treat you unfairly." Often a mirroring, paraphrasing or active listening response can effectively ward off an antagonistic exchange and possibly allow both participants to move to the next level of effective communication and problem-solving. While this may not appear directly related to the task, Robert's emotional reactivity has to be handled and diffused before problem-solving can begin.

Ineffective Communication Techniques Of course, adults as well as teenagers are prone to slip into their own particular brand of aggressive and hostile language. For example, Robert's father could respond, "You *should* want to help out" or "Don't talk to me that way; you *should* have taken care of your job when you got home from school. Why do *you always* make me get on your back?" "Should" statements, along with strategically placed "you always" statements, will frequently elicit defensive, retaliatory or withdrawal behavior in the teenager. Moreover, drudging up past misdeeds such as "You haven't changed. I remember last month when you promised to handle your chores differently. You broke your word then just as you did in the beginning of the school term with your homework and furthermore . . ., etc." will predictably trigger off a reciprocal barrage of complaints that Robert has likewise stored up about his unloving and judgmental parent.

Other ineffective communication techniques involve *communication cutoffs* as in "How dare you talk to me that way. I'm not going to waste my time trying to get through to you." With this remark, the parent glares disdainfully at the teenager and walks away without setting up a later time for more discussion and resolution. Likewise, the use of a rhetorical question such as "Why do you have to be so nasty?" is not designed to obtain an explanation for behavior. It is really an indirect criticism on what the adult perceives as obnoxious behavior.

Effective Communication Techniques To be effective and to keep one's feet on stable ground, one must persevere and stay focused on what the issue is at hand. For example, the adult might say, "I want to talk to you about your homework; however, I can really see how angry you are and that you are probably thinking I am picking on you. This may not be a good time to talk. Let's take a short time out. I'll check with you in about a half hour after both you and I have had a chance to relax ourselves a bit." Rather than cutting off communication abruptly and casting judgmental blasts at each other, the adult can thus declare a *time-out* or *short-term moratorium* designed to enable both participants to calm down and prepare for a more positive dialogue later.

Another staying focused strategy is to talk in the first person singular, e.g. "I think . . ." or "It is my opinion and you may disagree" or "I'm feeling. . . ." This enables the adult to take responsibility for his/her own

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thoughts or feelings and not to inadvertantly put him/herself into the victim position by blaming the learning disabled adolescent for the present state of affairs. In addition, the adult can request feedback. For example, "How do you feel about this?" or "How do you see this problem?" This communication, along with a delivery style suggesting real interest and concern, acknowledges the teenager's personhood and allows for a subsequent exchange of ideas and opinions.

Since adolescents with learning disabilities frequently lose track of the discussion and take a rigid or narrow point of view, frequent *paraphrasing* or *summarizing* might be useful. After talking for several exchanges, the adult might say, "Let me see if I get what you are saying. We may have different viewpoints here about your homework. You are feeling angry because I seem to get on you but not your sister. Am I on target so far?" This allows the parent and teenager to keep a clearer focus on what is being handled, maintain open minds, and possibly appreciate the different points of view that are present.

A feeling of competency is extremely important for learning disabled adolescents to develop and any adult *acknowledgment* could go a long way to augment the teenager's feeling of self-respect and confidence. Toward this end, the adult can frequently let the teenager know he/she understands what the teenager is saying or even thank him/her for the willingness to communicate a point of view. Even if the adolescent has been overemotional or apparently disrespectful, the parent or teacher could turn the conversation towards a positive note by saying something such as, "I appreciate your willingness to show me how strongly you feel about my favoritism. You've expressed yourself very clearly and forcefully." Acknowledging this allows the student to experience self-expression as helpful and might even reduce the high level of defensiveness.

Another useful communication technique is to ask the adolescent for *feedback*. After several rounds of exchange, again using Robert and his father as an example, Robert's father could say, "Let's stop here for a moment. I need to check out something with you. What are you hearing me say? Please play it back for me." This slows down the pace of the dialogue and assists the father in making sure that his feelings and opinions are being heard, or in determining where Robert's listening and understanding has broken down. If the latter is evident, then the next step would be to repeat a particular feeling or opinion for Robert.

If a consequence or disciplinary action is necessary, the situation would benefit by the adult first acknowledging what he's heard, summarizing the situation and then stating the position. For example, the adult could say, "I understand your annoyance and hurt feelings about this issue, but I am going to have to take this action anyway. If you feel it's unfair, I'll do my best to talk it over with you later." Such a verbal statement assists the teenager in realizing that the adult is not taking that position solely for the purpose of hostile revenge or retaliation.

As best as possible, the adult should protect the adolescent from looking like a fool. Most learning disabled teenagers really know when they are losing it in term of self control and they don't like these actions any more than does the adult. The youngster probably cannot do any better though and frequently has to continue with the disruptive behavior to "save face" if he/she feels the discussion is getting out of hand. Again, the adult can acknowledge the communication impass, call a time-out, disengage, calm down, and later come back for further discussion.

In summary, a reality based, communication processing approach works quite well in maintaining a responsible dialogue. With an awareness of the learning disability and defensive-affective aspects of the teenager's functioning, the adult is in a more flexible position to choose a response. Consequently, communication and problem solving are greatly enhanced. While the actual problem may not be immediately solved, the adult and adolescent can still share a common semantic environment to move around in and thus experience an enlarged sense of really "knowing the territory." □

Moss A. Jackson, Ph.D., a clinical psychologist serves as Chief Clinical Consultant to The Hill Top Preparatory School.

Strategies Training

continued from page 1

to happen and being ready for it. It provides the ability to have some control over a situation. That is what the language learning disabled individuals do not have. They become 21, 22, or 23 and may still not have the strategies for communications or interpersonal interactions that we take for granted. They get treated, very often, as retarded individuals and, indeed, some of them do come across as such.

Semantic Development

Ask a child, "What is a ball?" A three year old may say, "It rolls. It bounces. I can do it. Mommy can do it." The response is an action oriented description. At five or six years of age, the child gives descriptions and object names become not only action but possession and location oriented. This child will say, "You can throw it and it's round." They cannot give an exact description, but can say what something is on the basis of its attributes. The eight or nine year old will say, "A ball is something you play with. It is a toy or it can be used in sports. And it's round, but there are some that are really small and some of them bounce, but they don't all bounce. My daddy plays golf and his golf ball doesn't really bounce the way a rubber ball does. There are different kinds of balls." At this point, children get to categorizations. At eleven or twelve the child will say, "A ball is a round object that can be used to propel, to throw. It can be used in games such as . . ." At this age, we reach an adult definition explaining the different types of balls and their uses.

Other words used for research are bird and robin. Asked, "What is a bird?", a five or six year old will say, "It flies." When asked, "What's a robin?", the child will say, "It flies too." The eight or nine year old, when asked, "What's a bird?" says, "It flies and it has wings," or, "It flies and it chirps," or, "It flies and it lays eggs." When asked, "What's a robin like?", this child says, "It flies and it has a red chest." This child knows that it is differentiated from other birds by a red chest. The eleven or twelve year old will say, "A bird is a kind of animal that lays eggs, chirps, flies, has wings, etc. Different kinds of birds are. . . ." When asked, "What's a robin?" This child will say, "It's a kind of bird with a red chest. It's not very

large. You can see one around in your yard." At this age, the child assumes when he/she says bird, you will know what a bird is and, therefore, no further explanation of 'birdness' is needed.

Language learning disabled individuals may not develop the perspective in semantic strategy acquisition. They may not get to the classification. They cannot get into another person's brain and work from assumptions that this person has some of the pertinent information already. They cannot see a situation from another's perspective.

Communication Strategy Development

Communication strategy development relates to how you interact with others on a social or verbal level, such as talking on the phone, writing a letter, sending a card. To do this in a mature way, as an eleven or twelve year old, one must go through both cognitive developmental stages and linguistic semantic and syntactic stages. The language learning disabled lack finesse in perspective taking. How can they develop perspective when they cannot see the world through another person's eyes? Many times the language learning disabled show the communication strategies of a five or six year old. If lucky, they will show strategies of an eight or nine year old. The main task with these individuals is strategy development and strategy assessment.

Great progress has been made in the last 20 to 25 years in dealing with the learning disabled. There are labels now for these individuals that never existed before. Definite diagnoses can be made to find the specific disability. At this point, however, one segment can be more easily identified—the males. Diagnosticians can identify them and find the hallmarks of a language learning disabled child early, usually early elementary school if we know what to look for. The tests at that point are skills oriented. We check for deficiency and/or delay in processes such as short term auditory memory, morphological or syntactic applications (rules of the game for forming sentences), dysnomia (word finding difficulties). We also look at concept formation, and space and time language. At eleven to fourteen years of age, we should begin to look for something different. We look for higher level language strategy acquisition rather than skills. One strategy relates to interpreting multiple meanings. Another relates to the acquisition and interpretation of figurative, metaphoric or abstract language. Another strategy is reconstructing a conversation based on only parts of what was said. A fourth strategy is to follow-up on a conversation, to rethink and analyze people's intent. Language learning disabled may not have the "stand-back" ability to analyze and then apply a strategy to a conversation. In assessment at this point, we need to look at the strategies that are not developed. We need to come up with ways to develop these strategies within a cognitive, structured framework in which we can give the language learning disabled strategies to deal with the unfamiliar and the unknown to handle situations in a more effective way. Another strategy needing development is the ability to make alternative inferences (i.e., creating alternative scripts and solutions).

Pictured above are the key presenters at the fourth annual Hill Top Conference, "Language and Communication Disorders of the Learning Disabled Adolescent." From left to right are Edgar J. Kenton, III. M.D.; Elisabeth H. Wiig, Ph.D.; and Moss A. Jackson, Ph.D.

Unidentified Females

A major problem is that many language learning disabled females are unidentified and do not get the help they need because they remain unidentified for so long. Very often, these females do not show the common characteristics of the language learning disabled. When doing our early research, I, along with many colleagues, were given males to study, but very few females. We are finding now that females in families where males have already been identified are equally at risk. If they have good auditory and rote memory, and other strategies such as emotive language which is affective, dynamic and creative, nobody ever looks into their concept formation, their making inferences, their ability to deal with figurative language or their ability to deal with social verbal interactions. What we then find at age sixteen, seventeen, or older are females that are harmed for life. Some of them commit suicide, some of them become pregnant (they want a kitten though they know how not to get pregnant), some of them are anorexic. These females are often language learning disabled when looked at from a viewpoint of strategies development, but are not language learning disabled when looked at only on the basis of skills assessment and rote memory assessment. Diagnosticians look at girls from a viewpoint of sweetness and cuteness, creativity, affection, emotion, and cooperation. They do not see or pay any attention to the attentive deficits. They generalize or stereotype that all little girls are like that. Little girls are not like that! Strategy assessment, not just skills assessment is necessary to identify a potential language learning disability. □

Elisabeth H. Wiig, Ph.D., is a professor in the Department of Communication Disorders at Boston University.

Authors Describe Techniques To Increase Comprehension of Figurative Language

by June M. White, Fh.D., James H. Fisher, M.Div., Elissa L. Fisher, Ed.M.

This is a reprint of an article originally published in the March, 1984 issue of Academic Therapy, *(Vol. 19, No. 4.)*

Most learning disabled adolescents interpret literally such statements as, "You drive me up a wall," "Don't put me on," and, "He's pulling the wool over your eyes." When a teacher said, "You're pulling my leg," to a learning disabled adolescent, he looked under the table at the teacher's legs before he replied, "No, I'm not."

Teaching good reading skills must include teaching figurative language. When a learning disabled adolescent cannot understand figurative language, he/she often misunderstands the communication, resulting in serious confusion, weakened self-image, and a feeling of estrangement.

Many learning disabled draw conclusions based on perceptual information, not analytical skills. They receive information in "slide frames" rather than in "continuous running film." An adolescent may go to South America for a trip with his parents and report to you, "You know, it was just a trip." The adolescent does not absorb anything. Nothing gets connected. The teacher has to understand that in teaching figurative language, someone has to connect "the slides" or perceptions for the student.

Concrete Thinking

In a group discussion, a teacher said she had been to the Caribbean Islands and had seen all the monuments to Christopher Columbus. She said she had always been amazed at how Columbus had been able to keep those three ships together crossing the ocean. A boy replied, "Well, that was simple—with nails."

The leader stopped the group and said, "That's a good example of concrete thinking."

The boy looked at him and said, "I didn't say with concrete, I said with nails."

The leader seized this opportunity to assist the student in understanding figurative language. He stopped the process, but did not correct the student. He then began to help the student examine the data. He restated the abstract statement and then asked, "What else could that have meant?" At this point, the boy became hesitant. Noting the emotional reaction, the leader was aware the student probably felt foolish, or worse, "retarded," "This has happened a thousand times before," "What's wrong with me."

Others in the group were allowed to offer alternatives. The boy eventually understood that Columbus was able to keep the three ships sailing in the same direction, not that he was able to keep them together physically.

Diagnostic Indicators

Another example occurred in a literature class reading a Japanese story of a goddess coming to earth in the form of a tortoise to test the humanity of men. A young fisherman rescued her from a difficult situation. The next day, while fishing, the man saw the tortoise in the sea. She promised him a visit to the palace of the gods as a reward for the rescue. When the fisherman wondered how to get there, she replied, "I can show you the way thither."

After reading the story, one of the boys said, "What is a thether?"

The teacher responded, "It was not thether." She then went to the board and showed him the difference in the vowels. "It's thither." She had the student say it. She explained the meaning. She read, "I can show you the way there."

The class continued. About five minutes later the same boy thoughtfully said, "I can't believe that a turtle can say thither and I can't."

While the auditory perception and pronunciation problems had been alleviated, he still literally believed the tortoise spoke. The classroom environment was comfortable enough for him to express himself. He still did not totally grasp the meaning. This was a diagnostic indicator for the teacher to go back and do more work with the child.

Early Work

To teach figurative language, some early work is necessary. Students must develop an understanding of the difference between a literal and a figurative statement. A teacher must get very specific with the students. "John, if we say to you, get up out of your seat, walk to the window, open the window, and then go back to your seat, you know exactly what we mean, don't you? What do we mean?" After he responds, the teacher says "Do what we just asked you to do." He gets up, goes to the window, opens it, and then returns to his seat. We say, "You understood that because you did it. Right?" He shakes his head, letting us know he understood.

"Now, let us give you something else. See if you understand it. When we say to you, you drive us up a wall, do we mean we want you to get in a car with us and drive me up a wall? That we're going to go over there and, together in the vehicle, we are going to go up that wall. Is that what we mean?" Of course, the students always just break up laughing. Regardless of age, they see the ludicrousness of the example.

Then we go on to the next one. "If we say to you, you drive us crazy, what does that mean? Does that mean we get in a car and go to a place called crazy or we do something that makes us insane. Is that what we're talking about?" It is important to start with the data first, and then ask them, "What is said? What is meant?"

Throughout the year, the established example ("You drive me up the wall") as a "special example," our 'home base," can be used. This example pulls the student back into thinking about literal and figurative language of the teacher and forces him to think in a different way. He consciously makes that

decision, "I've got to think about that differently."

Practice

After this early work, practice is essential. The teacher must provide numerous opportunities for the student to make literal and figurative interpretations. Use all the old sayings such as "A bird in hand is worth two in the bush." Identify abstract statements, refer to "our special example," dissect the old sayings. What does it say? What does it mean? It's interesting because most students don't know these old sayings. Discuss them, write them on the board, and draw examples from the students.

Have students find examples in their written materials. Sometimes they may recognize an abstraction but may not understand it. Let the students dialogue with each other. Open up the channel of communication so one student doesn't hesitate to say to another, "Can you explain that?" Let students know it's okay to say, "I don't understand," and to explore with each other the meanings.

Extension

Understanding figurative language provides a springboard for developing cognitive skills in other subjects. In history, science and lliterature, analytical thinking can be viewed on three levels:

1. Literal: "The Mohawk Indians fought wars."
   It means what it says.
2. Interpretative: "The Mohawk Indians had a warring attitude."
   Does it say they fought wars?
   Do you think they fought wars?
3. Critical: "The Mohawk Indians were the most warlike nation in this part of the country."
   Do you agree with the author's statement?
   What can you tell me to support or dispute this statement?

The literal level is very clear. The interpretative requires going beyond the words to one's own interpretation. The critical requires discussion in class, debates between students, researching in the book. It puts shades of agreement or disagreement with the author's statement. It requires supporting data.

Throughout this process teachers must treat thinking skills and pereception together, not discreetly. Students with auditory perceptual problems, especially, need verbal discussion because they often misperceive the initial statements. The communication must be coupled with the thinking.

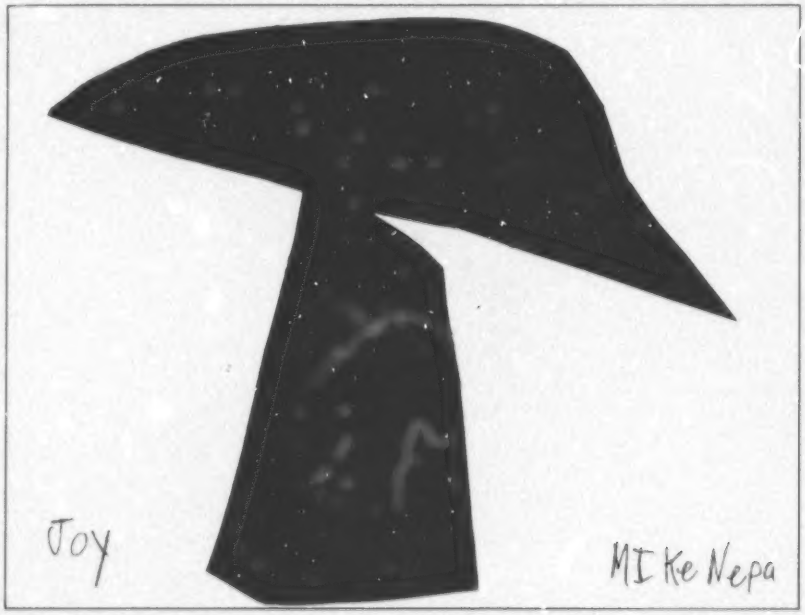
Review of Method

In summary, the following techniques will help to teach understanding of figurative language:

1. Work slowly, consistently, matter of factly (never condescendingly);
2. Provide an environment in which the child knows it's okay to know he/she doesn't understand or he/she can trust you to work it through;
3. Use contributions of child as diagnostic indicators (do not superimpose your grasp of the situation upon the child, let the student tell you what he/she thinks it says);
4. Develop student's skill in recognizing figurative statements;
5. Go back, restate, examine data each time an abstraction occurs;
6. Do much verbal work before paper and pencil; encourage students to "think out loud";
7. Practice finding examples of figurative language and understanding their meaning (this is critical; figurative language is not a topic that is "taught" and then finished).

With this method, we have found adolescents able to identify figurative statements within a few months and to acknowledge that they must think "differently." Some may still need help in understanding, but they are aware of exactly where the communication broke down. This allows the teacher to work through the language and full understanding of the written or verbal communication follows. □

Elissa L. Fisher, Ed.M., is Director of The Hill Top Preparatory School where June W. White, Ph.D., is Director of Special Projects, and James H. Fisher, M.Div. is Director of Clinical Services.



This design was created by a 14 year old student in an art class at Hill Top Preparatory School. The assignment to which the student was responding was to illustrate a word, phrase, or emotion using cut paper in black and white, and with no preliminary drawing. The emotion depicted here is "Joy."

Call for Papers . . .

Spectrum plans a future issue devoted to the topic, "The Learning Disabled Student in College." The editors are currently soliciting articles (maximum length of 1500 words) describing existing or planned programs with specifics about entrance requirements, services provided, and rates of attrition and graduation. Any modifications recommended to increase the potential for success in college for the learning disabled should be included.

Persons submitting articles for consideration should send two typed, double spaced copies of their manuscipts to:

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Deadline for submission for this issue is June 15, 1985.

Authors need to include their position and title. Manuscripts will not be returned unless a self-addressed, stamped envelope is included for that purpose.

HILL TOP Spectrum
Volume 2, No. 3 March 1985

In This Issue . . .

This issue of **Spectrum** focuses on language and learning disabilities. The articles by Elisabeth H. Wiig, Ph.D., and Moss A. Jackson, Ph.D., are based on their presentations at the fourth annual Hill Top Conference "Language and Communications Disorders of the Learning Disabled Adolescent," held on November 3, 1984. A future **Spectrum** will feature an article examining the topic from a neurological point of view as discussed by Edgar J. Kenton, III, M.D., at the same conference.

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Audiologist Describes Deficits in Central Auditory Processing of Learning Disabled Adolescents

Maxine L. Young, M.S., CCC-A/SP

It has been estimated that the average individual spends over 70% of a day communicating, with 45% of that time devoted to listening. (Butler, 1975) Students, particularly in the middle and upper level grades, probably spend 75-80% of classroom time listening. Therefore, the diagnosis and recognition of a student's inability to learn effectively through the auditory modality can be one of the most important factors in educational management.

Listening problems in young children are more easily recognized by teachers and parents. These are the children who, in the classroom, are easily distracted by non-meaningful sounds; the "listen and look" children who hear every dropped pencil, know when the door knob has been jiggled, can tell how many students have sharpened pencils and can do so because they are not only distracted by what they hear but look to see what has caused the noise. Teachers identify this population as having short attention spans when compared with peers. Frequent requests for repetition also typify these students, but their hearing is normal. Although some younger children with selective listening problems have a history of middle ear pathology that causes temporary fluctuations in hearing when fluid or infection develops behind the ear drum, this is not the cause of the pervasive difficulty. The inattentiveness and listening difficulties of young children have been attributed to immature development of the central auditory nervous system (CANS), (Willeford, 1980) but in adolescents and adults is attributed to idiosyncracy in how the CANS processes auditory stimuli.

Although the words perception and processing are often used interchangeably in the literature, a distinction can be made. The perception of a spoken word can be used to illustrate how the brain processes auditory language. We tend to think of the auditory nerve as being one continuous nerve that extends from the ear to the cortex. However, it is comprised of a series of nerve fibers that synapse with one another en route to the cortex. When a spoken word such as *cat* enters the ear and stimulates the auditory receptor organ, the cochlea, it begins to travel to the cortex, being transmitted through this series of nerve fibers. Once the word reaches the cortex, it is then processed as sensory stimuli at Heschel's gyrus, the primary auditory reception area. Word comprehension begins when the word is processed from Heschel's gyrus to the immediately surrounding cortical area called Wernicke's, where auditory associations occur and from which the auditory stimuli are processed to other association areas in the brain. For instance, the stimuli may be processed to the visual cortex, where visualization of the object may occur; to the parietal cortex, where tactile memory of touching a cat's fur may be recalled; or within the auditory association area itself, enabling the child to remember that a cat says "meow". The word is also differentiated linguistically from similar sounding words such as *cab* and from similar meaning words such as *tiger*. The word, however, in its associated form is still not fully comprehended until it is processed through a series of nerve fibers called the angular gyrus, to the visual cortex where, in beginning readers, the spoken word is seen in printed form.

If a child has been told to write a word, fibers process the word from the visual cortex, anteriorally, towards the front of the brain, to the motor cortex that controls hand movement. Simultaneously, fibers from the visual cortex are also processed to stimulate the muscles that control eye movement, so that eye and hand movement can be coordinated for the writing of the word. Both auditory and visual memory systems are working to hold the word in memory until it is fully written. All these activities from the cochlea to the cortex and within, from reception at the ear to perception within the

continued on page 4

A Neurologist's View

M.D. Sees Language Development As Bilateral Hemisphere Task

Edgar J. Kenton, III, M.D.

(This article is a transcription of a presentation at the Hill Top Conference on Language and Communication Disorders of Learning Disabled Adolescents, November 3, 1984)

A learning disability, as defined by performance that is socially and academically limited within prevailing educational approaches, covers a multitude of sins and often relegates the neurologist to a very small area in defining the problem. Nevertheless, we see individuals in late adolescence or early adulthood who have to interrelate in a society which increasingly demands the ability to focus in on a situation, sort it out, review, organize spatial relationships, and make appropriate responses. Yet, for the learning disabled, the ability to put together sequential demands in a logical fashion is disturbed. Neurologists are becoming concerned with right hemispheric problems in this population and are looking at the right hemisphere of the brain with particular regard to language.

Although the left cerebral hemisphere is dominant in language function or speech, language development is a bilateral hemispheric function and may be affected by multi-systemic disturbances of the body. Language requires synergistic integration of various associate pathways and is dependent upon acquisition, retention and utilization of linguistic information and symbolic content for expression.

In Penfield and Robert's study in 1959[1], electrical corticography, a means of stimulating the exposed brain during surgery, was used. With this method, they were able to locate language grouped in two areas of the left brain; one anteriorly, the Broca's expressive speech area, and more diffuse areas posteriorly, the Wernicke's receptive areas for disorders. (See illustration, page 4) As these types of studies continued, isolation of particular areas became pertinent for speech. The anterior Broca's area was seen as central for the expressive components of speech, and the posterior Wernicke's area for the receptive area of speech, especially ideational speech. Other speech centers, particularly in angular gyrus, were introduced in later studies.

With continuing use of electrical corticography, more areas of speech have been exposed. It is now possible to identify areas of agraphia, expressive aphasia, receptive aphasia, dyslexia, right-left disorientation, acalculia, and sensory disturbances of speech such as Gerstmann's Syndrome. Through additional studies, the auditory-receptive areas of speech have become evident as well as the primary visual areas for discriminating speech. In some instances, olfactory cues related to speech have been identified.

As these studies evolved, the left brain came to be considered an area for the motor process of speech, such as the expression of speech with particular regard to temporal relations. When further studies started to emphasize the spatial relations of speech and the role of the minor hemispheres, the right brain became important.

With studies in homolix areas, similar to what would be seen in the left brain, researchers realized that voice was important. By stimulating these areas, they could initiate aspects of speech. The relationship of the non-dominant hemisphere to the left hemisphere became important in the coordination of speech.

In more recent studies by Myers[2] and Gazzaniga and Sperry[3], the so-called Split-Brain Studies became important, particularly for integrative speech between the two hemispheres. Lesions placed in the corpus callosum produced difficulties in differentiating paired stimuli. For example, if visual stimuli were presented to one half of the visual field and the process was learned, and then the corpus callosum split, the information would be retained. The stimuli presented to the left visual field would transfer to the right hemisphere, go through the corpus callosum and become stored in the dominant left hemisphere. If the corpus callosum were first sectioned, information was not transferred between hemispheres reducing chances for retention. This meant that the corpus callosum is necessary for integrating the two hemispheres.

These studies point out the associative pathways of cerebral-cortical function for speech. Other types of sub-cortical structures are involved, particularly the thalamus and basal ganglia pathways. However, not only the cerebral hemispheres but also sub-cortical structures in the brain become relevant. Also involved is the temporal lobe which allows the brain to coordinate, retain and reiterate information with sensation and organizing memory.

The reticular activating system "turns on" the brain. If environmental stimuli are altered, the sensory input to the reticular activating system that energizes the cortical and subcortical structures of the brain allows projection from thalamus to cortex to coordinate the various associative pathways of the brain. In the hyperactive individual who experiences much extraneous stimuli, the reticular activating system is charged with erratic conduction to the associative pathways and coordinates in a very disjointed way with both hemispheres.

The reticular activating system relates to "on-off" phenomena or sleep-wakefulness. If there is a disturbance in the nuclei in the brain stem, there could be disturbances in sleep and in learning. This could lead toward hyperactivity or hypoactivity which reduces the reticular activating system, resulting in difficulty "turning on" the system.

Today, there is a more holistic approach to language function which becomes important in studying language through various etiologies. Disturbances can stem from conditions such as hypoglycemia which affects the temporal lobe or from structural impairments and malformations. Prenatal, perinatal and postnatal brain damage (anoxia) can also affect the temporal lobe. Depending on when the insult occurs during fetal development, the deficits may show varying degrees of expression. Malnourishment, delayed maturation, and other fetal disturbances likewise affect brain development. Certain areas of the brain are more vulnerable depending on the insult and the time the insult occurs.

Although such studies have been used with the learning disabled, they are still limited and much work is going on to standardize the techniques and to get select populations. However, the population remains heterogenous and the criteria for inclusion have yet to be standardized.

From evoked response studies, the concept of language has further developed and only certain areas in the dominant cerebral hemisphere have been considered specialized for language. Neurophysiological correlates for language showing intrahemispheric specificity to these areas have not been clearly identified, but evoked potential studies have been helpful. In the studies conducted by Fried, Ogemann and Fetz[9], the researchers used evoked potentials to isolate language. The neurophysiological correlates specific to a language task presented to the language cortex were noted. These studies used the event related or evoked potentials during silent naming which was then recorded on exposed human cortex. The cortex was subsequently shown to be specialized for language by the presence of errors in naming when it was electrically stimulated. When the evoked potentials were inspected, two changes related to the language-related cortex and to the language task were noted. One was the slow potential occuring at the motor and premotor sites. This slow potential was absent at the same sites when the same input was presented in the spatial task. There appears to be a difference in the spatial presentation as compared to the visual. Thus, there is some localization to visual input into the motor and premotor cortex. The potential shift was most prominent in the premotor cortex. This very sophisticated area of the brain is one of the last areas to develop and has a great deal to do with associative high integrative function.

Studies of evoked potentials measure these processes. In two cases, there was extensive sampling of the more anterior frontal areas where such potentials were limited to sites related to naming in the posterior, inferior and middle frontal gyri. Such sites correspond to the Broca's areas considered to be associated with expressive speech as discussed earlier. Potential shifts at the same sites were also recorded during cued or spontaneous overt vocalization. This suggested the potential shift seen in silent naming was a sign of processing to a stage of vocalization, another step in readiness for speech.

The major difference between overt speech and covert naming appeared to be the relationship of motor to premotor cortex. The potential shift was greater in the premotor cortex with silent naming, and in the motor cortex with overt speech. The impression of these investigations was that 1) specificity to a language task and sites in the language cortex seem to occur in parallel, and 2) that the slow potential shift was recorded in the premotor cortex, but desynchronization, the initiation of speech, involved the posterior language areas.

Studies such as these allow one to measure the anticipatory aspects of speech before the actual task can be recorded, thus emphasizing the significance of neuropsychological tests. Both phenomenon suggest focal cortical activation by language stimuli rather than activation of the cortex as a whole. Both changes are related to thalamocortical regions. In measuring the premotor cortex, the front parts of the brain, a relationship with deeper structures was demonstrated. With the evoked response tests, one can measure the anticipatory nature of language and record those areas involved. There seem to be two areas primarily: the sophisticated prefrontal areas that develop late, and the deeper structures which are corticothalamic with ties to the reticular activating system.

There have been other studies of dichotic listening patterns and hemispheric specialization[10], but where previously the left brain was thought dominant for speech, we now also look to the right brain and subcortical structures. Difficulties in adolescence and early adulthood present concerns about the right hemisphere with regards to personality or the ability to comprehend situations. The notion that the right hemisphere is minor is falling by the wayside. For example, if we were in a music class, a number of us could be dyslexic or have other language disabilities related to the left hemisphere, but we could do well since music is primarily a right hemisphere function. A disability is defined by the demand of the situation.

For references, see page 7

HILL TOP PREPARATORY SCHOOL

HILL TOP SPECTRUM

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CAP Deficits

continued from page 1

brain, occur for every word uttered and heard in a fraction of a second. The neurophysiological transmitting of the stimuli from one point to another within the brain is referred to as *processing*, whereas the comprehension of the stimuli is referred to as *perception*. Most tests administered by speech and language pathologists and learning specialists assess the perception of spoken language, but specialized audiometric tests called central auditory processing (CAP) tests assess processing functions within the central nervous system (CNS).

Around the age of puberty most of the areas of the CNS responsible for the comprehension of auditory language are fully matured. CAP tests are sensitive to the neuromaturational aspects of the CANS and, when given to children between six and ten, show developmental scores. Children with mildly abnormal scores in this age range may have developmental delays in CANS function that cause poor listening skills. Clinical evidence and longitudinal studies (Young, 1983) suggest that abnormal CAP test results beyond the age of twelve probably reflect idiosyncracy in how the brain processes auditory stimuli.

Behavioral Symptoms

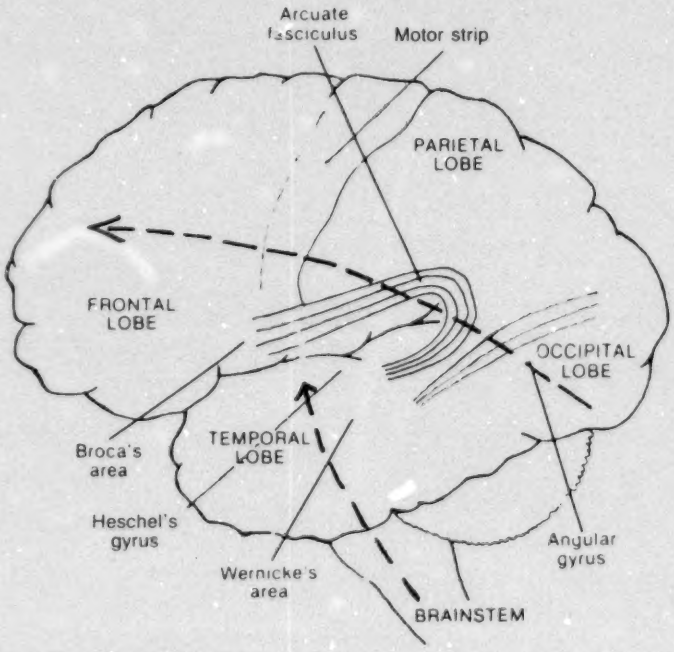
The listening deficits of adolescents, teenagers and college students can be destructively pervasive in an academic setting, but are not as easily recognized and diagnosed as in younger children. Because they were identified in the elementary grades, and in some cases therapeutically managed, they still listen to ambient noises in the environment, as when they were younger, but rarely look to identify the sound. Listening problems may be manifested in reading comprehension problems due to being distracted throughout a passage. Decoding difficulties are often due to weak phonics skills. Phonics is the most auditory approach to learning to read and, considering the developmental aspects of listening disorders, are taught in the most unfavorable listening environments of noisier first and second grades where auditory and visual distractions prevail. Some auditory perceptually impaired elementary students do well because of the redundancy in teaching methods. Older students complain of not being able to take notes because the teacher talks too fast or mumbles, and oral directions and instructions are still misinterpreted. One student told of taking pages of notes on a discussion of the war of 1560, only to find out when reading the textbook that the discussion was of the war of 1516. Auditory discrimination problems persist, particularly when redundancy is reduced and with less familiar vocabulary.

Some older students, particularly the more intelligent ones, have learned compensatory strategies, often unconsciously. They know who the good listeners in the classroom are and call them for homework assignments. Sitting in front of the class is preferred. They have found that studying with the radio on is distracting. However, academics can and do suffer. If an older student had only a problem with distractibility and inattentiveness during classroom lectures, satisfactory grades could be maintained if the student was a competent reader at least through the high school level. But most learning disabled students are not competent readers so they suffer in school and when doing homework. In college, lectures often differ from textbook material and reading competency provides the auditory-perceptually impaired student with only part of what is to be learned. Because of this, some young adults do not become identified as having serious learning problems until they begin learning in large classrooms where voices do not carry well, and when they are faced with more demanding academic programs for which they can no longer compensate. By college age, some students have well-developed visual memory strategies with which they have compensated.

Adolescents, because of their poor self-esteem, social ineptness, peer difficulties and behavioral problems which can be secondary to the learning disability, are often misidentified as socially and emotionally disturbed. The inattentiveness is attributed to their emotional instability. In some cases, poor listening skills are attributed to "bad habits" that are formed in earlier years, or exist because they were not taught at an earlier age. However, neurophysiologically, listening skills develop partly due to CNS development and may be reinforced as they develop by teaching listening skills.

Central Auditory Processing Tests

In the 1960's and early 70's, numerous diagnostic and remediation tools were developed for use by speech-pathologists and learning disabilities specialists to assess and remediate "psycholinguistic skills". Targeted by



Left half of brain. Vertical arrow shows auditory stimuli arriving at Heschel's gyrus. Horizontal arrow depicts visual stimuli being processed to motor strip and towards eyes for eye-hand coordination.

these tools were tests of visual and auditory perceptual functions, with some tests being modality-specific. Sub-skills such as visual and auditory sequential memory, closure, discrimination, and figure-ground were tested. Numerous therapy programs to remediate these skills were developed which have been criticized by some (Hamill and Larsen, 1974; Bloom and Lahey, 1978) who felt that the interrelatedness of perception and cognition prohibit skill isolation and remediation. With the growing influence of Luria's functional systems approach to the understanding of brain-behavior relationships and due to the contributions of neuropsychology to the field of learning disabilities, diagnostic and remedial approaches have significantly changed.

Central auditory processing tests are highly specialized audiologic tests that assess the development and integrity of the CANS and perceptual functions that may contribute to language and learning disabilities. These tests show a pattern of abnormal responses in learning disabled individuals whose listening problems interfere with academic success. The more commonly used CAP tests can be classified into three functional areas: 1) auditory selective attention, 2) resistance to distortion, and 3) sequencing (Dempsey, 1983). Examples of dichotic tests include those in which two sentences are presented simultaneously, one to each ear. Another consists of partially competing two-syllable words that are presented simultaneously to the ears which must be discriminated. Tests that assess resistance-to-noise require discrimination of speech stimuli that have been degraded by such techniques as frequency filtering in which part of the word is acoustically filtered, and altered time constants in which speech is compressed or expanded over time. Several of these tests have scoring procedures that consider sequencing errors and one test uses sequenced tones.

CAP test results appear to differentiate, based on clinical experience, between learning disabled students with primary perceptual deficits versus those with primary social-emotional problems. Responses to the perceptually impaired adolescent/young adult are due to idiosyncracy in the CANS and are characterized by error patterns that reflect differences in hemispheric function. Random errors or normal test results are usually obtained when the emotionally disturbed adolescent is tested. Students diagnosed as having Attention Deficit Disorder may or may not have abnormal auditory processing skills, suggesting that this diagnosis reflects a more global attention disorder, possibly compounded by abnormal perceptual functioning.

It has been suggested by Wiig and Semel (1976) that difficulty learning a foreign language may be attributed not only to a language disorder but to auditory perceptual disorder as well. Clinical evidence suggests that a subpopulation of learning disabled students who cannot learn a foreign language have abnormal CAP test results, particularly on the dichotic tests. Empirical evidence in the literature (Vaid, 1983) reports that brain function in normal bilinguals may differ from those who are competently fluent in only one language. Such differences were determined, in some studies, through the use of dichotic tests. Young (1985) has proposed that CAP tests be used to help identify this subpopulation.

Management Strategies

Once an adolescent has been identified as having an auditory perceptual deficit, and the degree of severity determined through CAP tests, recommendations and management strategies can be made. Some of the recommendations are similar to those made for the hearing-impaired such as preferential seating, small group or one-to-one instruction, using visual cues and aids, having instructors slow their rate of speech, and offering repetitions for the student who misinterprets what is said. These essentially involve manipulation of the student in the listening environment and modifying the oral-aural interaction between student and teacher. However, the use of metacognitive strategies with CAP disordered and learning disabled students has been advocated in recent literature (Young, 1984). For instance, a student who says he/she can remember a list of items by memorizing the first letter of each word and making a nonsense sentence using the acronym, is demonstrating metacognition of nmemonic strategies. Metacognitive strategies include verbal mediation or teaching the child to think and self-direct through speaking aloud, verbal rehearsal, paraphrasing using mental imagery to help focus memory and attention, networking or the use of outlines, using systemized retrieval in memory tasks and self-monitoring.

The benefit of using self-monitoring strategies was shown in a recent study in which an eight year old boy diagnosed with an attentional disorder was taught to attend. He was first cued to attend to a tape recorded message, then used self-initiated cues asking the question, "Am I paying attention?" His behavior significantly improved.

CAP disordered learning disabled adolescents, similar to the hearing-impaired, suffer from auditory learning problems that range from the most subtle to severe, and which can be silently hidden from obvious identification. The student who is randomly but continually distracted by ambient noise within the classroom, who cannot keep attention selectively on the teacher's voice, who "gets lost in a lecture", who misinterprets similar sounding words, and who cannot remember what the teacher said to do first is learning under the most trying of circumstances. A guesstimate as to the percentage of learning disabled students who have auditory perceptual problems is 50-60%. Auditory perceptual deficits are most detrimental in large group learning situations and open classrooms but may also be evident even in tutorial conditions, in severe cases. Speech in group learning situations should ideally be 30 decibels louder than background noise for comprehension. Yet, studies have shown that a teacher's voice may be equal to or even softer than the background noise at random times during the educational day.

Due to the importance of speech in the educational setting, and because comprehension of spoken language is critical to academic progress, recognizing auditory perceptual problems can make a significant difference. The key to success with the learning disabled is diagnostic-prescriptive teaching but first comes the diagnosis. If that diagnosis is auditory perceptual impairment, educational frustration can be circumvented by appropriate management based on behavioral assessments by teachers, parents, CAP tests results and special educational programs.

For references, see page 8

Tutor Watches for Indicators Suggesting Full Time Placement

Elizabeth P. Lohmann

Having been a professional tutor all my adult life, I have become aware that there are times when tutoring — no matter how effective — is not sufficient for certain students. At our private clinic for students with learning disabilities, we often must make difficult placement decisions. The need for alternate placement is sometimes, but not always, impossible to predict until there has been considerable on-going tutoring.

There are numerous signposts along the way that can indicate the need for full time placement in a remedial setting. Parents as well as tutors need to be aware of these indicators and be prepared to take appropriate action.

Temporary Placement

Often times students are accepted into our tutorial situation with our knowledge that this will be a temporary arrangement. The parents and/or the student are not yet ready to accept the seriousness of the situation; or perhaps the diagnosis/prognosis is too threatening to be assimilated or accepted. When one is dealing with parent/students who are still in the denial stage, it is important to give them extended time to assimilate information. This temporary placement in a tutorial setting provides the time to educate the parents and student and to alleviate their fears. In this situation, we consider ourselves a stopgap measure until the more appropriate placement can be made and accepted. As the student's remediation progresses, we help both parent and student to confront reality.

The High School Student

When the student is in the last four years of schooling, the demands on his/her system increase enormously. If the student has come to us with a very low reading level and the progress is not what we had hoped, it is usually quickly evident that time will run out; and it is far kinder if we suggest full time placement. The reading level of an older student must progress at least twice the normal rate if he/she is going to catch up. Often times this is possible in a tutoring situation, but there are occasions when this breakthrough does not occur. This is a definite sign that total immersion in a five day a week situation is necessary.

Current School Placement Demands

When a tutorial program is designed for a student, it is impossible to make it all encompassing. Five or six areas of concern are the most that a tutor should attempt to remediate within the time constraints of two sessions a week. Extensive remedial needs can be compounded by current academic demands. The child's school program can put pressure on the student to get help in algebra, when there are serious deficiencies in basic arithmetic which exist.

Another example could involve being asked to tutor a student in a ninth grade history course, using a book written on a ninth grade level. Unfortunately, the student's instructional reading level has been established at sixth grade. This is not an unusual situation. If the tutor and the school cannot work out a more appropriate program for this child, we must, of course, recommend other placement.

Social Changes

A definite warning that a student should be placed in a full time situation where the educational demands can be made more appropriate occurs when we are informed that our student is starting to have non-academic troubles at school. These would include disciplinary problems as well as noticeable differences in peer relationships; that is shifting to a new and perhaps less desirable group of friends, or a total loss of friends. If the social skills do not evolve in a developmentally appropriate way, this should be taken as a sign that the academic problems are spilling over and creating other and perhaps more serious problems for the child. Sometimes adding family therapy to our educational therapy is sufficient. However, there are often situations, particularly with older students, that demand full time placement in the appropriate academic and/or clinical setting. It is obviously valuable when both functions can be performed simultaneously.

Treading Water

The last and most difficult signal that changes in placement need to be recommended is one that can be labeled "treading water". When tutoring begins, most often there is dramatic improvement in specific areas. This is readily understandable as the student is finally receiving appropriate instruction in specific areas of need. For example, an unorganized child, with appropriate input from the tutor will quickly become more organized in little ways. Schools, parents and students often comment on these positive changes. The growth of self confidence is the first observable sign of positive change.

After the first two months of tutoring, this rapid progress logically slows to a modest progress to continue on a regular basis. This progress cannot be charted on a daily or weekly basis but must be examined over a period of months. It should resemble a slowly moving flow chart with a systematic progression from one level to another. Regressions will occur with regularity and are to be expected. They are a normal phenomena of the regular flow of learning. The experienced tutor will recognize this, expect it, and cope with it. It is the consistency of the flow that needs to be examined. If the progress is not consistent as measured both subjectively and objectively, then once again the referral to a full time placement should be made.

On a positive note, 85% of the students we work with do not require full time placement. It is vital that we identify and place the other 15% appropriately.

Elizabeth Lohmann is Director of the Learning Center, Wayne, Pa. □

Equestrian Activities Provide Arena for Successful Experience For Language Learning Disabled

Studies indicate many learning disabled students are language disabled and have great difficulty in appropriate verbal communication. Jeff Luciano, a twenty-year old graduate of Hill Top Preparatory School, has experienced the frustration of trying to communicate verbally with people and being unsuccessful. At an earlier age his difficulties in verbalizing thoughts were so severe that many thought he was retarded. Jeff now is so effective in his verbal interaction that he is completing courses at Delaware County Community College while enrolled as a transitional college student at Hill Top.

Jeff's personal growth and development were enriched by his experiences with horses. Equestrian work provided an environment in which he could function and be seen as non-handicapped. For many of his adolescent years Jeff rode once or twice a week at the Thorncroft Equestrian Center in Malvern, Pennsylvania. He moved rapidly from a beginning class into an advanced riding class then into vaulting and jumping classes. Interest in the sport grew to the point that he volunteered his time to help others in the handicapped riding program.

Jeff is described by his instructors as a skilled horseman who communicates with many horses as well or better than the owner of the horse. Jeff discovered that riding requires sensitivity in the body rather than language skills. Communication is effective without verbalization. The rider can relate to the horse without speaking.

Riding is a physical activity. The stimulation to the sole of the foot in the stirrups and the rhythmic harmony with 800 pounds of muscle and speed provides powerful experiences for Jeff. Riding stimulates a constant, even flow of energy and rhythm.

Good horsemanship requires coordination. Jeff mastered the coordination of the eye and the hand through guiding the horse and holding the bridle. His body imagery, spatial awareness, and visual integration improved as he coordinated his body with that of the horse. Learning benefitted since concentration improved after guiding an animal through the movement with the pressure of his legs and his hold on the reins. □

Jeff Luciano displays his riding form in recent competition at Thorncroft Equestrian Center.

The possible psychological benefits that come through riding horses were a bonus to the fun and physical exercise that Jeff enjoyed. Self-image, the way the rider perceives himself and the world, improved. A language disabled rider is not seen as handicapped since instruction is mostly non-verbal and horses do not read. The barn, the ring, and the trails provide situations in which a language disabled rider is in control without being verbal.

The special and often therapeutic qualities of horsemanship that Jeff found have been valuable to other handicapped youngsters and can be summarized as follows:

1) communication is effective without verbalization;
2) the body is physically stimulated;
3) coordination is mastered;
4) learning often improves;
5) self-image becomes more positive;

Realizing that a human's potential occurs in diverse settings, mainstreaming the learning disabled in a riding ring and a barn can result in exhilarating, challenging, and successful learning experiences for the learning disabled, especially the language learning disabled.

*This article is a compilation of information from Phoebe Centz, Thorncroft Equestrian Center, and June M. White, Ph.D., **Spectrum** Editor.* □

A Neurologist's View

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□

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From the Editors...

This issue concludes **Spectrum's** second year of publication. The editors acknowledge with gratitude the generous grant from The McLean Contributionship which has provided total financial support during this start-up period.

We also want to thank the many readers who wrote expressing appreciation for the publication and commending us for its quality. That kind of recognition from our colleagues means a great deal.

During the summer, we will be surveying to determine who wishes to continue receiving **Spectrum** and to inform you of subscription considerations. If you will not be available at that time at your **Spectrum** mailing address, please take a few moments now to let us know if we should keep you on our mailing list. We would also appreciate receiving your comments about past issues and/or suggestions for future articles.

Finally, we remind you of procedures for submitting articles for consideration in future issues. Persons wishing to do so may send two, typed, doubled spaced copies of their manuscript to:

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A brief resume of relevant professional experience should also be included. Previously published articles will not be considered and manuscripts will not be returned to the author unless a self-addressed, stamped envelope is enclosed for that purpose. You will be notified in writing of the decision regarding your manuscript.

Again, our thanks for your support these past two years. The next issue of **Spectrum** will be published in September.

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